



# The Identification of Amoebae in Dry Smears, from Cases of Pyorrhea.

By Thomas Le Cléar, New York City.

In the last few months several articles have appeared in the dental and medical journals dealing with amœbæ as the cause of pyorrhea, and the treatment of pyorrhea with an amœbacide, such as emetin. Bass and Johns (New Orleans Medical and Surgical Journal, November, 1914) describe the method of detecting amœbæ in fresh, unstained suspensions in warm physiological salt solution, and also give a method of double staining dry smears. The method of examining for motile amæbæ has the following disadvantages: The material must be examined immediately; the salt solution, slide and microscope stage must be warm, and the amæbæ under these conditions retain their motility for only ten to fifteen minutes.

As the dentist could not, as a rule, stop to make such an examination while treating patients, it occurred to the writer that it would take but a moment of the dentist's time to spread some of the scrapings on a glass slide and place same aside for staining and examination at a more convenient time.

The method of obtaining material, spreading, drying and staining, which the writer has used with very satisfactory results, is as follows:

Method of Making Smears.

If any pus is observed and can be pressed out, it is wiped off and discarded. With an instrument or a toothpick remove scrapings from the bottom of pus pockets, or between teeth and gums in places where there is a suspicion of the beginning of

pyorrhea. This material is then smeared in the centre of a glass slide and allowed to dry; pass quickly through the flame of a Bunsen burner five or six times in order to fix it firmly on the slide; stained cold with carbol fuchsin solution for fifteen seconds; wash with water and stain with Löffler's methylene blue solution for thirty seconds; wash with water; blot gently with filter paper; dry and examine, preferably with a 1/12 inch oil immersion lens and an eye piece of such a power as to give a magnification of approximately 500 diameters. This method of double staining gives results which admit of a ready differentiation of annæbæ from pus cells and epithelia (about the only elements which are liable to occur in such material, which might possibly be mistaken for amæbæ), and also stain the bacteria very satisfactorily.

Amœbæ, when thus prepared, are usually two or three times the size of pus cells. They appear round or ovoid, and are occasionally surrounded by a clear zone. Their rims take a blue or purple stain, while their inclusions stain pink or light red. The interior of the amæbæ frequently resembles a net work which stains a pale blue, much lighter than the rim. (See Fig. I.)

Pus cells, on the other hand, may be distinguished as follows: The protoplasm or body of pus cell stains a rather indefinite pale pink, and contains two, three or four irregular shaped nuclei which stain dark blue. They are usually present in abundance, whereas from one to six amæbæ may be found in some fields and none in others. (See Fig. 2.)

Epithelia, occurring in such proportions, are usually much larger than amœbæ, and have a single nucleus. The protoplasm stains pink and the nucleus blue (see Fig. 2). In this connection it should be kept in mind that cells often take up stains differently in different parts of the same preparation, especially where there is considerable difference in thickness. Therefore the colors will not always be just as described, but in fairly thin preparations they will usually be found so.

The writer hopes that this description of stained preparations will help others to identify the amœbæ, which appear at this time to cause so much discomfort either as the cause or at least as a contributary cause of pyorrhea and its many complications. Certainly the detection of amæbæ in early cases ought to be of considerable value to the patient. Examinations before and after treatment in well-marked cases would undoubtedly be of value in determining the efficacy of treatment.

In closing, the writer desires to express his thanks and indebtedness to Dr. J. H. Stebbins for making the photomicrographs.

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### H Qure for Pyorrhea is no New Ching in Dentistry.

By Paul R. Stillman, D.D.S., New York City.

There has been so much laudatory talk in the past few months concerning emetin and its use in the treatment of pyorrhea that an opinion from one who is giving his professional time to this and its allied conditions may be interesting. One fact seems to be entirely overlooked by those who have identified themselves with this new treatment, and it is, that a cure for pyorrhea is no new thing in dentistry. Pyorrhea has been successfully treated since the days of Dr. Riggs, and it is the writer's opinion that there are at present at least fifty men who are successful in treating the disease.

The use of emetin as a "cure," since the reports on its use by Barrett\*1 in Philadelphia, and Bass and Johns\*2 in New Orleans, has been very generally adopted by the general practitioner, both in dentistry and medicine. It is being widely advertised as a specific by those who are interested commercially in its sale. Much newspaper and magazine space has been given to this new remedy, lauding it as a "new cure."

A large majority of the men who are exploiting it are those who have had no success with the proven methods of treatment, and who are not trained in the technique necessary in effecting cures. I wish to caution these men who have taken cases for treatment with emetin that the harvest is not yet here, bright as the prospect may seem to them.

There are three certain, undisputed factors in the treatment of pyorrhea that never can be overlooked in its successful treatment.

1st. The most important symptom to overcome is trauma. All loose teeth that have occlusion are found to possess this symptom. The trauma must be reduced by grinding, and the tooth ligated in such a manner as to insure stable fixation. Until this has been done there will be no progress.

2nd. Hygiene must be taught and established as a habit. The mouth must be made clean.

3rd. All concretions must be removed and all necrotic root surfaces made surgically clean. This must be accomplished by "planing," or "curetting," according to the instruments employed.

When these three things are correctly accomplished, the case will be so far advanced in convalescence that the thought of injecting emetin will not enter the operator's mind.

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There is no easy method of curing pyorrhea, but there are some

<sup>\*1</sup> Dental Cosmos, August and December, 1914.

<sup>\*2</sup> Journal American Medical Association, February 13, 1915.

thousands of cases cured each year by scrupulously conscientious operators, who know their subject and who have had sufficient zeal and ability to master the technique necessary to secure results. Cases cured in this manner *stay cured*, as any competent periodontist will attest.

### Che Emetin Error.

By Jules J. Sarrazin, D.D.S., New Orleans.

During the latter part of August, or the beginning of September, 1914, without reference to the previous labors of Chiavaro, Barrett and Smith, in the same field, the New Orleans morning and afternoon papers were aglow with a specific treatment for Riggs' disease, based on amœbic etiology, promising magic results. Some weight to this idea of an "easy road to Heaven" was given by interviews with reporters, which were published. My first impulse was to hold back judgment, expecting such public newspaper talks to be disclaimed as not being authorized, even though the amœbic etiology and treatment were affirmed, which at that time seemed incredible to me, because of the utter disregard for infected cementum and carious bone then set forth. However, on September 14, 1914, at a meeting of the Orleans Parish Medical Society, the amœbic etiology and therapy were promulgated on lines quite identical with the above-mentioned newspaper articles.

Not having yet made any tests, but being strongly impressed by the well-known systemic factors and local etiology of Riggs' disease, and convinced that a sincere but dangerous error was being promulgated, I then limited myself to pointing to it in broad terms, cautioning against a blind and free use of the treatment before its value was established.

On October 26th, again at a meeting of the Orleans Parish Medical Society, the emetin-ipecac treatment was presented, based on some two hundred cases successfully treated, the amœba buccalis being the criminal, it being carried from mouth to hand and hand to mouth, or from mouth to street car rail, thence to hand, to toothpick and to gums, the toothpick playing a most dangerous part in the infection carrying process. I fully agreed that the deleterious results following toothpick traumatism rendered it an undesirable instrument in usual mouth conditions, but I also pointed out that the toothpick amæbic etiology was unnecessary to Riggs' disease, because inspissated mucus on teeth necks, charged with dead epithelial cells and infectious bacteria, furnished the local part of the etiology by themselves, aggravated by lime salt deposits when present, while the resistance of tissues was lowered by the usual dystrophic atrophy of the human maxillary and mandibular structures.



#### Results of Creatment with Emetin.

I had by that time been testing the emetinipecac treatment, and stated my results. Tumified, bleedy gums, in habitually neglected mouths, had markedly improved as a result of removing salivary calculi and brushing away a part of the septic films

Results from mouth hygiene are generous beyond the off teeth necks. proportion of its thoroughness, although perfect results come from perfect technique only. Fluid extract of ipecac, or even plain water, would benefit tissues habitually infected by filth, the patient's attention having been drawn to mouth cleansing, it being done a little more and better than usual. I also reported at the same time that in no case of loose teeth, or suppurating pockets, or carious alveoli had I seen any objective improvement from the ipecac-emetin treatment. Discomfort to patients from such teeth usually lessens as any treatment is instituted. implies no real change of conditions, and, as time demonstrates, no cure. Of course, I had abstained from any systemic measure other than emetin hypodermically administered and locally from going beyond the removal of chunky deposits off roots. I was testing the amœbic emetin-ipecac treatment clinically. In some of those cases hypodermics of emetin had been given for six consecutive days, followed by weekly injections, doses ranging from 2/3 gr. to I gr., while ipecac was irrigated in fundi pockets and used on the tooth brush, with no real improvement in over five weeks.

## of Amoeba Cheory.

My surprise became great on October 28th, Further Development when, at a meeting of the First and Second Districts of the Louisiana State Dental Society. I heard the amæbic theory married to the infective mucus film

etiology which I had mentioned two days earlier, instead of the amæbæ being carried on toothpicks. Since amœbæ feed off the protein molecule broken up by infectious bacteria, it is unquestionably proper to locate them in inspissated mucus films, which supply the true local etiology of Riggs' disease. Bacteriologists are generally agreed that amœba buccalis has no pathological significance, and feed as just mentioned, while, on the other hand, the amæba hystolytica of Schaudinn and Craig, and the tetragena of Hartmann and Vierick, is a tissue burrower.

The amœbic etiology has just recently merged into still another phase, making the amœba buccalis the carrier of pathogenic germs into alveolar pockets. Since laboratory experiments upon autolized tissue, amæbæ in symbiosis with infectious bacteria, show the former throwing off the latter after feeding on the protein molecule freed by them, it is not at all surprising that pathogenic bacteria should be present with amœbæ buccalis. For a few infectious bacteria thus located, there would be myriads of them independently infecting soft tissues, the leukocytes

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of which are neither numerous nor active enough to destroy bacteria as rapidly as they gain entrance. If we would remember that Riggs' disease requires two causes to produce its suppurative stage, we would be less easily disturbed by any fanciful etiology ascribed to it. The dystrophic atrophy of alveolar tissues, due as much to the fact that arterial blood must be pumped upwards to them, because of their being transitory structures, explains why the suppurative process easily results from adjacent infectious cervical films or deposits. We there have the predisposing, or less resistant, systemic condition, and the determining local factor. Under favorable conditions the latter is resisted by the former. Again, in the absence of local infection, but with destruction of alveoli due to insufficient blood nourishment, teeth became lost from lack of support. With these facts in view, any imaginative etiology is puerile.

Anna Williams, of the Park Laboratory of the New York Board of Health, has just been conducting a series of tests where amœbæ buccalis have been found in:

Normal children's mouths, 50% Slightly diseased adult mouths, 80% Mouths with pus pockets, 90%

It is noteworthy that a large proportion of the children were infants. Amœbæ are so widely distributed in nature that no surprise need result. As we are not wont to expect Riggs' disease in the mouths of children, these investigations rather point to the increased presence of amœbæ in more luscious pasture grounds, as a result of favorable conditions for their nourishment, but not as a cause of disease.

There is here no intention to question the destruction of amœbæ buccalis by emetin or ipecac. This is quite beyond doubt. On the other hand, there is strong reason to believe that these amœbæ are unjustly accused of producing conditions which they only enjoy; that the health of innocent victims are being threatened by strepto and staphylococci allowed to carry on infection while amœbicides constitute treatment. Unquestionably it would seem desirable to sound that warning as loudly in the public's ear as was the sincere but misleading error of amæbic etiology. It would be far better for some teeth to be speedily sacrificed than to jeopardize health by maintaining dangerous foci of infection.

Cests of Emetin Creatment. All the successive negative amoebic treatment results which I have seen have for some time convinced me that the amoebic etiology belongs to that large class of theories which may be applied only before conclusive tests are made, and I regret it

sincerely, first, because I have faith in the sincerity of the men who have devoted great energy and time to these original researches, and



second, because hope for a rapid and easy cure, which would have been a boon to humanity, is blasted. One test alone could outweigh painstaking, thorough clinical evidence based on intimate knowledge of Riggs' disease pathology. This would be the production of the suppurative disease in the mouth of a fairly healthy subject affected with superficial gingivitis, chair and home oral prophylaxis being perfectly carried out, while following the latter nightly, at bedtime, gingival margins would be generously smeared with a pure culture of amæba buccalis. Such a test would carry weight if conducted with flawless details. Considering that cultures of amæbæ on autolized tissue are not infrequent laboratory technique, such cultures would be accessible.

Whenever iodine is painted on gums, or any germicidal solution thereon, or in pockets, is used, other than emetin or ipecac, a reliable factor is brought in the treatment which destroys micro-organisms other than amæbæ, producing results due to reaching the correct etiology of the disease. Improved conditions resulting should not then be credited to the emetin-ipecac treatment. A mouth wash containing iodine will also be similarly misleading if used in connection with the amæbic treatment. Likewise, the so-called "planing" of roots removes material infected by germs other than amæbæ, and must also be avoided in testing the merits of the emetin treatment.

A factor which sometimes misleads experimentation with emetin hydrochlorid is that it is mildly germicidal to pathogenic germs, such as streptococci and staphylococci.

Since the amœbæ buccalis do not occur in tissues far beyond necrotic areas, but are present in and at the fundi of pockets filled with pus, and bounded by carious bone and infected cementum, it is reasonable to deduce that emetin hypodermics, while they may serve to lessen the danger of systemic infection, play a little part in inhibiting micro-organic growth in Riggs' pockets, where, of course, no blood circulates. Quite similarly, vaccines may exert a favorable influence on systemic morbidmanifestations resulting from infection by germs identical with those composing the vaccine, but, owing to the fact that no blood circulates through the pockets of suppurative Riggs' disease, it is idle to expect that either these pockets themselves or their contents may be affected by such hypodermic injections. It is what is done locally and directly into the pockets themselves which is the beneficial procedure in both instances. Therefore, irrigating pyorrheal pockets with emetin or ipecac, owing to a weak germicidal action, will lessen, without completely checking the pus exudates in chronic cases. This diminution is more marked after irrigating pockets for the first time than at any subsequent repetition, simply because pus does not accumulate as thickly in such lesions in

twenty-four or forty-eight hours, as in the preceding mouths during which treatment was either completely omitted or done haphazardly. In other words, due to far greater germicidal power to truly pathogenic micro-organisms, if a solution of iodine crystals had been substituted for topical use, the control of suppuration would have been far greater, although not complete without the removal of local infectious and irritating factors, backed by adequate systemic measures where indicated.

Again, it may be easily understood why results misleading and deceptive to the casual, inexperienced or superficial observer of Riggs' disease conditions may occur in the acute stages under emetin-ipecac treatment before old chronic pus pockets have existed. There yet being no such pus pockets on roots, the topical use of ipecac inhibits the surface growth of streptococci and staphylococci, while blood hypodermically charged with emetin protects the gums it permeates. Add the usual fact of more and better mouth hygiene having just been instituted, and gingival conditions would inevitably improve before the formation of pus pockets.

The local rôle played in the production of Riggs' disease by inspissated mucous and bacterial cervical plaques is so plain to students of that etiology, the adjacent tissues succumbing to that infection, frequently coupled as it is with irritation from hard deposits, and habitually in the presence of dystrophic tissue atrophy, that it seems puerile to train Riggs' observers to conjure innocent non-pathogenic amœbæ to cause lesions they only inhabit to feed therein, and the pathology of which does not suggest their concurrence.

Since it has recently become common routine medical practice to treat Riggs' disease hypodermically, or by mouth only, it would behoove me as well to announce a specific treatment for a systemic disease, the phases of and therapy for which I am ignorant of, except from hearsay of medical practitioners, with limited special experience therewith, and to then loudly herald my new system of treatment before it had been thoroughly tested in professional circles. Results from such well-meaning errors are rendered harmful in proportion to the weight of authority which sincerely promulgates them, countless healths and lives being threatened by septic oral conditions, which should have been corrected; in many cases extraction being far preferable to their continuance. The gravity of the situation is increased by local directions for mouth hygiene being given by some physicians in connection with the new specific emetin treatment, which disregard the fundamental etiology of infectious bacterial plaques on approximal teeth necks, advising brushing teeth without stimulating gingival circulation, and without even passing floss between Indeed, there would be vastly more oral prophylaxis in disre-



garding the tooth brush entirely, but insisting instead on thoroughly rubbing a minute flat tape on all approximal teeth faces and necks, mesial and distal, and employing a clean rag to break up thickened mucous films on all exposed dental surfaces, even though gingival stimulation, along with other well-established and proven oral prophylactic measures, which rest on the combined experience of experts in that line, was discarded by medical men in assuming the rôle of mouth hygienists.

The paramount importance of patients constantly breaking up and removing infectious inspissated mucous films from all faces of teeth necks, and developing a highly polished surface thereat, especially mesially and distally, where septic deposits are otherwise left undisturbed, is easily realized by considering that infection otherwise causes the timehonored pathological stages of congestion, inflammation and suppuration wherever tissue resistance is lacking, as is usually the case in gingival ones. As to the amœbæ buccalis, it is perfectly in accord with natural law that they should be feeding in the bacterial plaques mentioned, that they should pass on to recesses in gingival margins as invaded and diseased, and that as peridental tissues break down in the above-described etiological and pathological processes that they should occupy the fundi of pockets, where a more favorable pasture invites them: stagnant pus cells, not red blod corpuscles. Like ducks, they should migrate to more favorable feeding grounds, but not as fast. They are unquestionably apt to be present, but not accountable as pathological factors. Etiology and clinic both thus point.

### What is the highest Function of the Dental Profession?

By Maurice William, D.D.S., New York.

The first quarter of the twentieth century will go down in dental history as a period of reconstruction. That dentistry is seeking to find itself is evident even to a most casual observed. It would be almost an impossibility in these days to open a dental journal and not find at least one article bearing on the important question of recent tendencies in the dental profession.

The editor of the ITEMS OF INTEREST has to his credit a number of contributions on this important phase of current dental history. The editorial in the March issue, "The Greatest Problem of the Day in Dentistry," is most timely. In it he has marshalled all the facts bearing upon a very complex problem, but tactfully shrinks from the task of rendering a solution, and would rather put it up to his readers. His closing line, "What shall we reply?" is a challenge to every serious minded member of the dental profession.

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I cannot resist the temptation to be one of the many to accept that challenge. One can but venture the hope that all the ink that will be spent by various contributors will result in something concrete which may react favorably both to our profession and to humanity.

Che Ideal Root-Filling. It is now pretty generally accepted by the profession that root work has taken on the importance of a major operation when considered from the standpoint of the possible consequences of its failure.

Such men as Dr. Rhein and Dr. Ottolengui have scientifically demonstrated the technique which must be applied to obtain certain results. The success of the operation cannot be determined without proper radiographic checking. Root work done in any other manner may have dire consequences. The question naturally arises, "What would be the cost to the patient for proper root work?" Fees for services of this character, including radiographs, would come to anywhere between \$25 and \$100 per tooth, which is another way of saying that proper root work is out of the question for the average man, woman or child.

If we are to judge from the income-tax returns, but one-half of one per cent. of the American people enjoy an income of over three or four thousand dollars per year, which is approximately \$60 to \$80 per week. By far the vast majority of the people must get along on anywhere between \$800 to \$2,000 per year. How is it possible for the great majority to pay for perfect root canal work? The thing is simply out of the question. If it is true that improper root work is inimical to life, then society is doomed, unless another way out is to be found.

Suppose we now ask ourselves the question, "Why root work?" Is there no way of reducing the need for root work? Let us of the dental profession be honest with ourselves. Root canals must have fillings within them, God's or man's. Where is there the man who would dare make the claim that his root filling is superior to Nature's? Which, then, is the greater service that the dental profession can render, to preserve Nature's root filling or to substitute an artificial one? Surely the answer is obvious. With all due respect to our justly celebrated root canal wizards, I, for one, would rather have Nature's root fillings than theirs, even though they should offer to give me the benefit of their exceptional skill without charge. I am certain that both Dr. Rhein and Dr. Ottolengui would be the first to endorse these views. So that after all, then, it is not entirely a question of the financial ability to pay, but goes far deeper than that.

Medicine Versus Dentistry.

It seems to me that it is about time that the dental profession determined upon its true status. Unless this is done we shall keep on reasoning in a circle, dealing with effects, not causes, and will ulti-



mately end in bringing down upon our heads the odium of society instead of its warmest approbation.

Is ours a specialty of medicine? Are we members of the healing art? This we must now determine once and for all, if we are ever to get at a solution of the vexing problems that confront us daily. I wish to be placed on record as holding the position that ours is not a branch of medicine and that we are not members of a healing profession. Ask the average dentist to tell you what is the fundamental difference between the medical man and the dentist in relation to the diseases he is called upon to treat? He will either not know what you are talking about or will not be able to give you the correct answer. And yet the correct answer to this question is the key to the solution of our problems.

The physician and the dentist approach the diseases that they are called upon to treat from diamentrically opposite premises. speaking, the physician deals with diseases that are curable, whereas the dentist in the main is called upon to treat diseases which are incurable. In order that there may be no misunderstanding about this, it may be we'll to remember that the definition for curable is "to restore to normal, i. e., as Nature first created it. Dental tissue once destroyed is never restored by Nature. If this be true (and where is there the man with the temerity to deny it?) what is the greatest service that the dental profession can render humanity? The greatest service that the dental profession can render humanity is to educate it to the fact that we cannot cure dental diseases, but that we can do much to prevent them. We must give to the public all our knowledge concerning the relation of mouth conditions to general health and of the importance of saving the natura! teeth. Dental science can be of invaluable assistance in the preservation of the natural teeth.

The dentist's services fall under three distinct heads; in the order of their importance they are as follows:

I.—To educate the public as to the relation of mouth conditions to general health, the importance of saving the natural teeth and to assist in their preservation.

2.—To detect incipient caries and to replace it with an artificial substitute.

3.—And least important, the replacing with artificial substitutes some or all of the teeth.

Is there a dentist living who would quarrel with my arrangement of the relative importance of the three subdivisions of our service to society?

It is admitted, then, as a fact that the third subdivision of our service is the least constructive to our patients. And yet what do the facts

teach us? That this, the least constructive service we have to offer, is a ractically the only service that the great mass of humanity receives at our hands. Ask the average man or woman to tell you what is the highest function of the dental profession and the answer invariably will be, "To fill teeth and make false teeth." This is not to be wondered at in the least. It is the direct result of the education we have been imparting. Much encouragement may be gathered from this, for it proves how amenable society is to education.

### A Practical Method for Discharging Our Highest Function.

We have seen that our highest function is that of teachers. Our first duty to society is to educate it in the knowledge that the dental profession cannot cure dental diseases. There is no such thing as a cure for dental diseases. Society must be made to realize that the greatest service that the dental profession has to offer is to assist in the preservation of the natural teeth and in the maintenance of a healthy mouth; that the failure to maintain healthy mouth conditions leads to systemic diseases, which undermine health and vitality, and may lead to premature death. These fundamental truths we must bring to society through the medium of lectures, newspapers, magazine articles, pamphlets, and any other method which could be made to serve the purpose.

Just as soon as society is armed with the facts in our possession it will at once set about an effort to stamp out the frightful scourge which is undermining the vitality of the nation. Public sentiment will be roused to a high pitch. The warning cry sounded by us will be taken up by every newspaper and publicity agency in the country. halls will ring with stirring speeches, all having as their text, "To arms, to arms! against the insidious enemy within our midst; our greatest asset, the nerve, bone and sinew of our people, is at stake, the vitality of our nation must be protected, let the cost be what it may." Efficiency experts will be called upon to study the problem. The report of their findings will amaze the nation. They will report that there are more sound cattle in the nation than sound men, that our workers are only fifty per cent. healthy, and that their capacity to produce wealth is thus automatically limited. Political economists will take up the study of the question, and will show us the frightful economic waste traceable to this They will show the relation of body diseases (many of which have their origin in faulty mouth conditions), to the need for hospitals, sanitoria, alms-houses, jails and prisons, and will prove with indisputable figures that the greatest economy that the State could practice would be to assume the responsibility for the education of its people on all subjects relating to their physical health.

Then, and then only, will the dental profession be recognized at its true worth. The State will look to us to stamp out preventable



diseases. We shall become social servants, gaining our livelihood in protecting the health of society rather than profiting through the diseases that afflict our fellowmen.

Am I an impractical visionary, am I a utopian dreamer, a speculating idealist, or is there just ground for believing that the dream of to-day is to be the reality of to-morrow? I claim that the solution that I present is not only practical, but it is *inevitable*. Society will not go on forever paying the penalty of ignorance. We have too long already kept from it the knowledge so essential to its welfare. The dental profession can never atone for its crimes against humanity. We can only hope that society will show a magnanimous spirit and will not visit upon us the only punishment which is fitting the crime—the contempt of our fellowmen. Already is there to be heard ominous rumbling of protests from every side.

When a man like Dr. Osler makes the statement that "more physical deterioration is caused by defective teeth than by alcohol," it would be difficult for the dental profession to clear itself of the charge that it has been satisfied to permit such a frightful condition to prevail without sounding a note of warning.

When a man like Dr. Wiley makes the statement that "one thousand children die daily in this country, and their deaths are due more to defective teeth than to any other trouble," he by those very words calls upon society to witness what frightful crimes the dental profession is guilty of in keeping to itself the knowledge which could prevent this ghastly slaughter. And if side by side with these statements we put Dr. Hunter's classic arraignment of septic dentistry, society will be justified in drawing the conclusion that the dental profession fosters the conditions that have called forth notes of warning from Dr. Osler, Dr. Wiley, and others, so that it may coin the people's misery into dollars and cents for itself by foisting upon the people the septic dentistry which Dr. Hunter so justly condemns.

Society is already beginning to heed the warnings, most of which come to them from outside of the dental profession. Can we afford to tarry for another single second in the discharge of our greatest duty to society, even when considered only from the standpoint of our own honor and self-respect? It is no longer a question whether society shall have this knowledge, but rather one of who shall have the honor and glory of imparting this knowledge. Our choice lies here and nowhere else.

It remains but to prove that with the spread of the knowledge of mouth conditions as factors in the preservation of health must come an insistent and persistent demand for the assumption of social responsibility by society for the preservation of its health. With society in possession of the knowledge which proves the havoc wrought, because of its failure to gain the benefits from preventive dentistry, and with the lessons

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learned from the application of the principles of preventive dentistry, it will become evident that, viewed from whatever angle, it will be economy of the most frugal kind for society itself to assume the responsibility for the protection of the health of its citizens.

I could quote from social workers, from hygienists and famous physicians, as well as economists, to prove the correctness of the above statement. The taxpayer is to-day burdened with taxes which are made necessary in order that society may cope with the results of its failure to assume the responsibility for the protection of the health of its citizens. If from no other standpoint than that of a money-making proposition, society is bound to assume responsibility. This is the age of efficiency and economy. Who is there who would rise to state that these principles will not be applied to our greatest natural resource, the health of the people?

Dental Members of Realth Boards.

Not only is this sure to come, but it is here already. The foundation is laid in the shape of our Boards of Health. These are continuously broadening their scope and to-day are extending their

domain to the dental field, to the extent of municipal dental clinics, in all the important cities of the State. With increasing public sentiment which will result from a greater knowledge of the relation of mouth conditions to general health will come a proportional increase in the assumption of social responsibility for the dental needs of our citizens.

In the city of Detroit, Michigan, public sentiment on this question has reached such a stage as to result in the appointment of a dentist, Dr. Oakman, as Commissioner of Health. If in Detroit, why not in New York? If in New York, why not in Washington? Public sentiment is the determining factor. Let the public have the knowledge and this knowledge must crystallize in sentiment and this sentiment will in turn crystallize in the social responsibility by the people for the best interests of the people. With that accomplished, the dental profession will have found itself. Then, and then only, shall we be a united profession, for the conditions will no longer exist to make it possible for dental parlors and illegal practitioners to prey upon the sufferings of humanity and the premium which is now placed upon unethical practice will disappear.

Every dentist will give to society the best that the dental profession has to offer—preventive dentistry. A social servant giving of his best to humanity, in return for which society will grant him a self-respecting livelihood and the approbation and esteem of his fellowmen.

Thus will the problem be solved, both for the dental profession and for humanity.

Is this inevitable solution to have the recognition and support of the powers in the profession, or is it to come in spite of their indifference?



# Bridgework Conducive to Health and the Instruments for Constructing it.\*

By HERMAN E. S. CHAYES, D.D.S., New York.

In the year of 1910 there appeared in ITEMS OF INTEREST an article entitled "Empiricism of Bridgework," by the present writer, in which the methods of practicing this work were roundly and fully condemned. The attention of the profession was called to the inefficiency of the so-called "crown and bridgework" as an accessory to the health of the patient and to the vicious influence it was exerting upon health, because of the wrong principles upon which it was constructed. That article contained a promise made by the writer that he would substitute for these inefficient methods in vogue a method of crown and bridgework, the successful practice of which should make it conducive to the health of the patient, and the time has come when this promise is to be redeemed. May I be permitted to quote a short paragraph from the end of the article entitled "Empiricism of Bridgework"? In order to refresh our memory and revivify our hold upon the past, also in order to bring it home to the reader that no attempt has been made to evade the responsibility which any man assumes when he condemns a system, to substitute for it something which he feels is better for all concerned.

"Hence it will prove more sound to entirely ignore the fact that bridgework has existed at all, either as a science or as an art, because as practiced heretofore it cannot lay just claim to either name. And let us take our knowledge of physics and chemistry, geometry and general mathe-

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matics; of metallurgy and general mechanics; add to that our love for art, our developed esthetic sense, our honest desire to do our best, and, using the latter as a binder, let us combine the former with what knowledge we have of anatomy and physiology and the hygienic requirements of the maxillary region of the genus homo; let us start cautiously, build carefully, be sure of the indisputable correctness of our foundation beyond the shadow of a reasonable doubt, and then step by step let us proceed until we reach the limit of our knowledge and power to add correctly to what we have done; let us then sensibly cease and pass the result on to one more gifted to build what has been painstakingly and carefully constructed. Then only will the knowledge of crown and bridgework be a matter of cumulative evolution, and then only can we hope to earn for that department of dentistry the two names most cherished—'science' and 'art.'"

The foregoing quotation is just as true to-day as it was five years ago, and it will be just as true five years hence, and the quotation which is about to follow, and which will be the last from the article on "Empiricism of Bridgework," will, perhaps, give the reader some idea of the amount of work involved in the substitution of what the writer considers a sane system of crown and bridgework for an insane one, and will tend to mitigate, if mitigation be needed, the writer's five years of comparative silence which has followed the publication of the article:

"I am conscious of the risk, and I do not dread the possible storm of antagonism, for I realize that I am dealing with men who can reason and think, and then, again, the major part of what is to follow consists simply of mathematical facts, axiomatic truths and physical laws adapted, modified at times, it is true, in order to make them elastic enough to fit and co-act with the life and activity of the maxillary region of the human anatomy, and that part of this which does not so consist of accredited mathmetical facts is theory evolved along lines of logical reasoning, and by force of its own argument it must be accepted as reasonable and true until the contrary be proven."

This quotation also is as true to-day as it was five years ago, but perhaps with all your willingness to believe all that I have said, it may be more convincing if I offer you one potent piece of evidence of present-day empiricism, which more than all else would enable you to realize that I have not exaggerated regarding this work.

What is Grown and Bridgework? And now may I ask you who read this to read what is to follow this, and to read what is to follow that thereafter, written by the same hand, and, of course, emanating from the same source? May I ask you dentists all over this wide land to tell me



what it is you have been practicing under the name of crown and bridgework? Can you, any of you, answer my question when I ask for a definition of crown and bridgework—a clear, comprehensive, lucid, understandable and easily grasped definition of something which you have been practicing for thirty years or more? Can you give it to me? You can-And your literature, which runs into volume after volume, and vour book-shelves loaded down with material, with bound copies of dental magazines and text-books which you used during your college term, all of them are barren; all of them fight shy of defining what you have been doing for thirty years or more, and what you are now ashamed to cal<sup>1</sup> crown and bridgework. Now let me ask you men who will read this to judge for yourselves and tell me what more profound empiricism can there be than that of the man who, while engaged in a task of constructing something, knows not what he constructs. What more deadly and devastating ignorance can be conceived than that of the bigot, the fanatic who does things in a certain way, not knowing what he does, but doing them solely because they who did these things before him pursued the same methods, with the same devastating results?

Does this seem harsh and unjust criticism? For if it does, I shall call upon some of you who read this to produce your scrap heap of bridges which you have removed from the mouths of various patients at different times. Would it not be a curious sensation for some of us to recognize in the scrap heap of our fellow practitioners a piece of our own handiwork, placed in the mouth of a patient some years back; placed there with such assurance that it was the right thing in the right place; that we were almost willing to write a book about it, singing its praises and advocating its use. Some years later this patient, in trouble, seeks the services of another man, and he, in his effort to relieve the patient of pay and pain, removes the vile and ill-smelling contrivance placed there some years ago by the first man, and replaces it with one of his own make, equally as good, but now somewhat more extensive and, of course, somewhat more expensive. This goes on in regular sequence until the last few roots have been gently and efficiently dislodged from the legitimate bed, and the patient's mandible and maxillæ present a smooth, rosy appearance, so favorable for the adaptation of complete dentures. That is a perfectly true and uncontrovertible statement, substantiated by all the scrap heaps of all the practicing dentists in this and other lands, and it should make us perfectly willing to forget what we knew or know of crown and bridgework, empirically practiced to the detriment of the public for so many years. And it should make us willing to begin anew, and begin properly by first acquainting ourselves with what it is we wish to do, and then proceed to do it.

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Bridgework Defined and Classified. Bridgework is the art of supplying edentulous spaces with artificial teeth in such a manner as to definitely limit their vertical and lateral displacement by using some natural teeth or roots which are present, as piers or abutments. Bridgework is

divided into two systems—the fixed and removable system—and here the writer wishes to go on record with the statement that in dividing bridgework into two systems—fixed and removable—he controverts the possible accusation of his ultra radicalism. He is willing to concede that there is a system of fixed bridgework, or that it is possible that some men consider that there is a system of fixed bridgework, and that there is some room for the practice of such a system, and he has, therefore, attempted to work out a technique for such a system, which, while not being conducive to the health of the patient in the full sense of the words, yet partially condones the practice by rendering it less harmful than in the past. For the moment, then, we shall divide bridgework into these two systems—fixed and removable; both are classified in accordance with the teeth involved, as simple, compound, complex and cantilever.

Simple Bridge. First: A simple bridge is one where the artificial substitute and the piers are subjected to the same physical stress, that is, where the stress is exercised in the same direction. Example: Supplying a

second upper or lower molar, using the third and first molars as abutments, or supplying the two upper or lower centrals, using the laterals as abutments (not an advisable procedure).

Compound Bridge. Second: A compound bridge is one in which the artificial substitute, by virtue of its position and acquired occlusal relation, is subjected to a stress different from that which works upon the abutments.

Eaximple: Supplying a lateral incisor, upper or lower, using the cuspid and central as abutments; or supplying a second lower bicuspid, using the first molar and first bicuspid as abutments.

Complex Bridge. Third: A complex bridge is one in which the artificial substitutes are subjected to a stress wholly foreign to the stress of the abutments, and where the abutments are situated upon opposite sides of the

arch. Example: Supplying four anterior teeth, using the cuspids as abutments, or supplying the four incisors and the four bicuspids and first molars, using the cuspids and second molars as abutments or piers.



#### Cantilever Bridge.

Fourth: A cantilever bridge is one which is attached to natural abutments at one end only, and depends upon the resillient mucosa for its major support. Combinations of complex and cantilever

bridges may exist, such as cases presenting anterior abutments upon both sides of the arch and posterior abutments on one side only. The practice of all bridgework must be subject to certain essentials, none of which may be overlooked without impairing the value of the fixture as an accessory to the health of the patient, and, broadly speaking, may be summed up as follows:

#### Essential Factors in Bridgework.

First: The mechanical essentials of a bridge are abutments, attachments, saddle and artificial teeth.

Second: Macroscopic essentials of a bridge are the correct mesio-distal, bucco-lingual and gingivo-occlusal measurements of all the mechanical essentials

Third: The surgical essentials of a bridge are the extirpation of the pulps when necessity for this operation exists; the correct cleaning out and filling of the root-canals and the proper preparation of the pier teeth or the cavities within them.

Fourth: The physiological essentials of a bridge are the interplay of the surgical and mechanical essentials with the adjacent and subjacent tissue in such a manner as to facilitate the occurrence of intermittent pressure upon the subjacent resilient mucosa during mastication.

Fifth: The phonetic essentials of a bridge will be complied with when its form has been correctly produced, for only then will it play its part as a resonater, amplifier and articulator of sound.

Because dental bridgework usually and nearly always means an artificial fixture for the human mouth, it may be broadly defined as a dental operation. Any dental operation may be correct or incorrect, and a correct dental operation may be defined as one, the result of which is conducive to the health of the individual upon whom the operation is performed. And we understand under the term "health" the maintenance of that vital balance which is expressed by the normal functioning of all organs which compose the human body.

The teeth are organs of incision, prehension, mastication, and as accessories of vocalization, speaking or singing, have these varied functions to perform. To be best suited for this task, Nature has caused them to acquire in the process of their development certain qualities and certain definite structural shapes. Any deviation from their macroscopic normality and their microscopic organization, causes a lack of functional efficiency and interferes with their normal contribution toward the main-

tenance of vital balance. Hence all dental efforts should be directed toward a re-creation of macro- and microscopic acceptableness of these organs when they require our attention at all.

Importance of Interplay of Parts.

In health, teeth, gums, in fact, all organs in the animal body, perform their function as a matter of grateful exercise without undue consciousness on the part of the animal, contributing to the maintenance of an efficient organization, in which the income is

greater than the expenditure to obtain this income. But in order to obtain such a condition we must have perfect interplay of all organs making up the animal body, and the first requisite for perfect interplay is absolute lack of interference by one organ with any other one or more organs.

We have had our lecture in anatomy of the teeth, and we know what they look like, or we should know. We have had our lectures in physiology, and we know what the gums and adjoining structures look like in a healthy mouth; we have likewise been able to learn the beautiful lessons of occlusion. All these should have given us a picture of healthy conditions not easily erased. And it is this picture we must ever seek to re-create, and we cannot re-create it *en masse* unless we re-create it in spots in individual teeth and their surrounding gingivæ.

Let me call your attention to a remarkable realization which must come to all of us who would endeavor to obliterate the effects of human error upon the human system. Every molecule which makes up the human, or animal, or plant body, is in a state of constant rhythmic movement, which motion is in definite geometric relation to the motion of the molecules neighboring it, which warrants the conclusion that the molecules influence one another by their rhythmic movements to the point of causing corresponding geometric gyrations in each other.

This is, of course, not a matter of first causation, that is, not a matter of life inception, but rather a matter of life maintenance by virtue of the maintenance of the equilibrium.

If we conceive the animal as a delicate clock or watch for example we may obtain a concrete illustration of the inter-relation of all the organs. Let us assume that we are accelerating the minute hand of a clock by slowly rotating it to the right (take out your watch and make the example more concrete), we can readily understand that we shall by this act influence the entire mechanism to a more accelerated motion, and that this motion will be in definite relation to the intensity of the accelerator force, and that there will be a definite rhythmic and geometric relation between the motion of each separate piece of mechanism which makes up the whole of the clock.



If we now remove the influence of the accelerator force an immediate rhythmic and geometric adjustment takes place, and the hands of the clock proceed to travel at the original speed. This may be called a stimulating interference with the mechanism and results in a greater amount of work or activity being done in a given time than the apparatus was intended for. If we now place the hour hand at the numeral "9" and the minute hand at the numeral "3," and suspend a minute weight from the extremity of the hour hand, we shall have an inhibitory interference with the mechanism, resulting in a given amount of energy doing a smaller amount of work than the apparatus was intended for; the spring will uncoil or attempt to uncoil at the same ratio, but its effect upon the wheels, and through these upon the hands, will be less marked than before; again there will be a rhythmic and geometric readjustment between the various parts of the clock, and another readjustment to normal when the inhibitory interference is removed.

Up to a certain point these experiments may be repeated without impairing the inherent virility of the spring, but as soon as the point of impairment is reached, a rhythmic readjustment becomes impossible, a lack of perfect interplay manifests itself, resulting in a heedlessness of expression; the parts interfere with one another, and a great deal of energy is expended to bring about a result; work which is as unsatisfactory as it is unreliable.

#### Mobility of Natural Ceeth.

For the purpose of elimination of mechanical shock to the nervous system during mastication, and for the purpose of enhancing the vibrating effect produced during vocalization, be it singing or speaking; also for the purpose of minimizing mechanical

injury to the teeth themselves, the latter are held in their bony sockets through the intermediary agency of an elastic membrane, which is so disposed beneath and around them, as to fairly hold them suspended in a resilient cushion.

The elastic fibres composing the membrane disposes themselves longitudinally, diagonally, transversely and circularly around the teeth; they interlace with the periosteum and with the gum tissue, and thus, during the exercise of dental function they effect an increase of circulation into the surrounding parts, which constantly brings fresh nourishment to these tissues.

The very structure of this elastic membrane and its peculiar function precludes the possibility of abundant blood supply and makes it a ready prey to inhibitory interference. Such inhibitory interference may be brought about by impaction of foods into what are known as interdental spaces, more by the accumulation of calcific material known as tartar.

either upon or around the neck of the tooth, or upon portions of the root. The impaction of foods into the interdental spaces may be caused by the malrelation of the adjoining teeth (malocclusion), or by the improper restoration of approximal surfaces of teeth calling for dental attention. An inhibitory interference may also be brought about by a break in the continuity of surface upon a tooth in the region mentioned. A tooth may be filled, inlayed or crowned and a portion of the filling material may have been left extending beyond the margin of the cavity, or the crown may extend away from the gingival circumference, exercising a pressure upon the surrounding gum tissue.

If pressure be exerted upon any one or two teeth in the mouth, the pressure will be transmitted to all the surrounding structures, and through them to all other teeth in the same mouth in a series of rhythmic waves or undulations of varying degrees changing the physical outline of the surrounding structures in every direction. Upon the cessation of the pressure a rythmic and geometric readjustment will take place in these tissues and a return to a condition of comparative equilibristic rest obtains. Where there are no inhibitory interferences, that is, where the relation of the teeth is correct, as to position, condition and form, these pressure induced waves or undulations may take place ad infinitum with beneficial results, because under a correct condition, intermittent pressure is the essential stimulating interference inducing an increase of circulation, bringing with it a fresh supply of nutriment essential to life maintenance.

When inhibitory interferences are present, that is, when the relation of the teeth is not correct as to position, condition and form, each pressure exerted upon the teeth during mastication causes the same series of waves and undulations in the soft tissues surrounding them, but each wave or undulation causes these tissues to come in contact with injuring or bruising obstructions and the rhythm of recoil or readjustment is first interfered with and ultimately destroyed.

Food débris, overhanging fillings, ill-fitting crowns, incorrect bridges, fixed or removable, open cavities, calcerious or calcific and soft epithelial deposits, may all be classed as inhibitory interferences with the free and unhampered undulating and very essential excursions of the soft tissues surrounding the teeth. All of them produce states not conducive to the health of the individual, and are, therefore, incorrect dental conditions; and any dental operation which will entirely eliminate them will be an operation conducive to the health of the individual, and therefore a correct dental operation.



Exercise of Cissue Needful to Health.

All tissues must be exercised, or, rather, they must have the freedom to indulge in such exercise as they need, and all tissues of all organs need exercise to keep them from undergoing atrophic changes. Hence, anything which will interfere with the free

and unhampered undulations of the gum tissue, by any means whatever, results in pathological conditions by bringing about, first, a lethargic state in the tissue; second, a diminution in vasso-motor actions, because of lack of restimulation; third, an accumulation of waste material in the cellular and intercellular substance resulting in a rapid death of cells; fourth, an atrophy or loss of tissue, resulting in a physical change, which makes it difficult to maintain a hygienic balance.

Besides serving as bacteriological breeding places, the usual kind of bridgework, which in the exercise of our vocation we have often been called upon to clean and which we must now condemn, serve also to rob the teeth acting as abutments and the surrounding gum tissue of every change of free and unhampered motion, and such work brings about all the deleterious consequences mentioned heretofore. It will be well for us to remember that in all cases where teeth have been lost, and where artificial substitutes in the shape of bridgework are to be resorted to, the rational thing to do is to make the mucous structure carry the stress. The abutments or natural teeth, which act as supports for the bridge, must simply serve to prevent the vertical displacement of it during mastication, and they must so interplay with the bridge that they (the abutments) will be effectually kept from migrating into fields other than their own. Outside of these two requirements, nothing more should be expected from them.

The bridge itself must during mastication gently and to a limited extent ride upon the alveolar ridge covered with the mucosa, and so be made to supply the intermittent stimulating interferences essential for the enhancement of fresh nutriment by virtue of the increased pressure-induced circulation to the end tissues.

Artificial restorations in the form of bridgework must be constructed so that they will not interfere with the maintenance of the hygienic balance essential to proper sanitation.

Wherever you find a crown, the circumference of which extends away from the gingival circumference of the tooth, you have discovered or uncovered an inhibitory interference with the maintenance of correct oral conditions. Any piece of bridgework presenting the possibilities of retaining food débris, or exercising an unequal pressure upon the alveolar ridge, or lacking in occlusal restoration, or lacking in anatomical acceptableness, is an inhibitory interference with the maintenance of correct oral

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The elimination of these inhibitory interferences and the substitution of proper restoration in the cases involved will, therefore, constitute operations conducive to the health of the individual, and so may be classed as correct dental operation.

#### Abutments and Attachments.

What has been said of bridgework as a whole applies, of course, to abutments and attachments in detail. Abutments may be broadly divided into posterior and anterior. One of the first essentials in construction of these piers is rational and radical root-work where the pulp is involved.

Time will not permit the treatment of this phase of the work, and we will be content to remember that if any root-canals are here referred to we will assume that they have been properly treated.

The sum total of anchorage, that is, the sum total of contact surface between post and surface of abutments with the root, must be at least one-third greater than that part of the abutment which is exposed to grinding or triturating stress.

Preparation of Roots.

This calls for a preparation of the root which varies as the direction of stress which these teeth are called upon to resist.

The root end must present certain angles, and these angles vary in obliquity, inversely as the stress, that is, the greater the stress the less oblique the angle.

What has been said of the non-interference of the bridge as a whole applies most emphatically to the abutments. The continuity between the abutments and the root or tooth it rests upon must be left unbroken. Great care must be exercised not to encroach too deeply upon the subgingival area, and the impairment of the peridental membrane must be carefully guarded against.

Size and Shape of Posts.

No post which in size is large enough to threaten the integrity of the root should ever be used. If for any reason it becomes necessary to use a post longer than two-thirds of the root, the post should taper for the gingival half of its length, and be cylindrical for its occlusal half, and

its occlusal half should be threaded. Anterior abutments in removable bridgework consist either of a root cap and tube, a root floor Abutments. and tube, a lingual inlay and tube, or an artificial

crown carrying some slot or sleeve or post.

Posterior abutments in removable bridgework may consist of a telescope crown, or a shell crown may be used containing a keyed slot; or it may carry a tube or post either in a vertical or horizontal direction. Or the root of the posterior tooth may be prepared to receive an inlay,



which in turn may carry a post either in a depression formed upon the inlay occlusally, or it may carry a post attached to it in an upright position.

We must always remember that we expect these abutments to serve us in preventing vertical displacements of the bridge by their relation to the attachments which will engage them. That is, they must prevent any vertical displacement beyond the linear height presented by the displacement of the soft tissue during mastication, and that it would prove decidedly advantageous to so construct our abutments that they will engage our attachments in a manner which will admit of some latero-rotary play during exercise of usual functions. And finally any completed abutment must be so made that it will restore to the mouth a dental organ capable of exercising all natural functions: mastication, trituration, incision, pre hension and vocalization.

# Abutments in Fixed Bridgework.

In fixed bridgework the abutments may consist of inlays supplemented by posts as root anchors; posterior and anterior, of Darby crowns, the bases of which have been cast; anterior and posterior, of shell crowns made in accordance with a technique outlined

by the writer some years ago in the ITEMS OF INTEREST, in an article called "The Metallic Molar Crown."

The same general rules which apply to the abutments for removable work hold good here, and the necessity for contact surface between the abutments and the tooth or root carrying it is greater in fixed than in removable work.

The reason for this is simple enough when we remember that the principle involved in removable work is always that of the pontoon bridge, while that involved in fixed work is always that of the arch, span and suspension. A pontoon bridge is one which is supported through its entire length upon a yielding cushion, while a fixed bridge is one in which two or more piers carry a span of a certain length.

Exceptions may be taken to this latter definition, and it may be urged that some construct their fixed work so that there is a definite point of support for each artificial tooth, making up the span, which support they obtain by scraping the model, so that the artificial tooth is fairly buried in the mucosa, and the answer to this would be, first, that such action is against all principles underlying the maintenance of nutrition in the end tissues, and that no matter how harmless the result may seem to be, it is at best tolerated by the tissues and constitutes a condition not conducive to the health of the individual. It tends permanently to displace tissue from its proper environment usurping the location for itself in a spirit

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of unfriendly conquest which nature always resents and ultimately punishes us for.

The occlusion in abutments for fixed or removable work requires the very minutest attention, and the veriest ideal in occlusal restoration must be striven for if we seek permanence of work. Reference is here made to the final requirements of abutments, that is, all abutments must be so made that they will restore to the mouth a dental organ capable of exercising all normal functions: mastication, trituration, incision, prehension and vocalization.

Attachments are the intermediary agencies which link the artificial restoration known as bridgework to the abutments. They are made a movable or fixed part of the bridge, as the case may require, which requirement will be made clear from a consideration of the study models and an exposition of direction of stress to which the abutments and the bridge will be subjected. Wherever possible, it is best to have the attachment form the male portion of an appliance, which will be completed when this portion is inserted into a corresponding female part existing in the abutment.

The one essential fact to remember in the construction of abutments is that they must definitely and frictionally engage whatever space exists for them in the abutments, any latero-rotary play being provided by semitubular spring or claw construction, or by the provisions of an arc or sufficient curve to take into account the amount of soft tissue displacement during mastication.

If a box and friction plate be used, the box must be placed into the abutment and must run as nearly bucco-lingually as possible; its shape must be that of the rectangle; the friction plate attachment is joined to the bridge, and it is so filed gingivally that it presents an arc, to which the perfectly straight floor upon the gingival part of the box shall be tangent. The sides of the friction plates are filed in the same manner. We thus produce three straight lines tangent to three curves.

# Importance of Perfect Parallelism.

The parallelism of the two attachments and abutments will enable the bridge to yield in a vertical direction under stress, while the curve upon as many sides of the friction plate will provide a lateral yield. A summation of the yield provided, plus the resiliency

of the gum tissues will result in the latero-rotary yield essential to all simulation of natural tooth movement.

We have mentioned the parallelism of the abutments and attachments, and we will realize that they are the essential mechanical requirements



of a bridge. If the bridge is to be a fixed appliance, the abutments must be parallel, because we must be enabled to cement the bridge into position without exercising any pathological stress upon the pier teeth.

If the bridge is removable, abutments must be parallel, so that the parallel attachments may engage them frictionally and easily, and so that the appliances may ride gently and to a limited extent upon the mucosa during mastication.

In order to obtain such parallelism, certain instruments called a parallelometer and parallelodrill, respectively, were designed.

The essential in the mechanical construction of any bridge is that it shall go into the edentulous space for which it is intended, without exercising any stresses whatever upon the teeth or roots acting as piers or abutments.\*

In a fixed bridge, this means that the abutments, whatever they may be, must be absolutely parallel.

In a removable bridge it means that the abutments or piers must be parallel to each other, and that the attachments which are to engage the abutments must be absolutely parallel to the abutments.

The word "absolutely" is used, not in any relative sense, but in the real sense of its meaning.

Any abutment which during insertion or removal of a piece of bridgework is subjected to stress is a doomed member of the patient's dental equipment, unless the condition is obliterated by rectifying the error.

Parallelism of abutments is therefore the relative determinator of the mechanical success of a piece of fixed or removable bridgework.

The smaller the span to be bridged, the more perfect must be the parallelism of abutments and attachments.

The parallelism of abutments should be inversely proportioned to the distance of the abutments from one another.

A deviation from the parallel must be unappreciable to the sense of sight or touch, no matter what the distance between the abutments.

#### **Bental** Parallelometer.

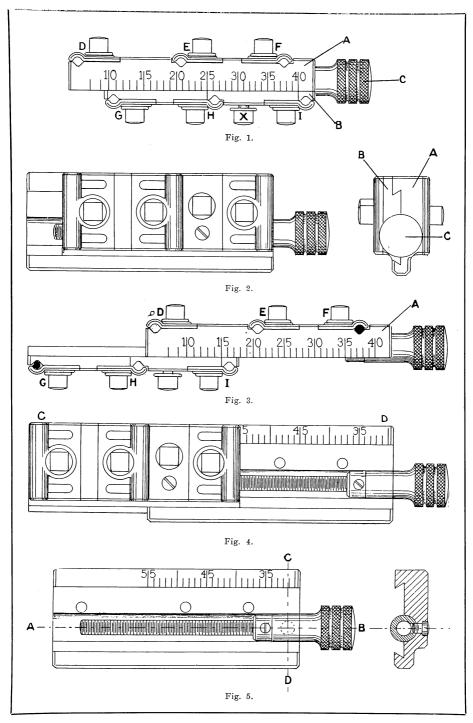
The dental parallelometer is an instrument for carrying, placing and taking impressions of attachments for fixed and removable bridgework at various distances, measured in micro-millimeter terms and in-

suring the juxtaposition of these attachments to the respective abutments in equi-distant relation to each other.

It consists of two rectangular metallic sections (Fig. 1, A and B), and an actuating screw (Fig. 1, C), which engaging the section B and held down to the section A at the point of intersection of line A and B, C and D,

<sup>\*</sup>Italicized by the Editor.





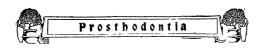


Fig. 5, will, when turned, cause a change in linear adjustment between A and B, Fig. 1.

Each metallic section carries 3 clamps, D, E, F, G, H, I, for holding in place the various mandrils used for carrying the different attachments which a specific case may require, Figs. 1 and 3.

The body of the instrument is 40 mm. long. Its linear dimension may be increased to 55 mm.

The upper surface of section A, Fig. 3, is graduated in mm. form from 1-40, the graduation being continued upon the engaging surface of the same section from 35-55 mm., Figs. 4 and 5.

Fig. 6 is an end view of the engaging sections and shows the positive resistance to any deviation from a perfect horizontal.

Fig. 7 shows the parallelometer with five of the clamps in action, illustrating the peculiar system of measurement which enables us to obtain a constantly decreasing unit of measure by constantly increasing number of turns of the screw.

When the abutments of a bridge are more than 25 mm. and less than 40 mm. apart, clamp D, upon section A (Fig. 7), shall be the unit point, and clamp I, upon section B, shall be the movable point at which the mandril for the required attachments shall be held.

When the abutments of a bridge are more than 10 mm. and less than 25 mm. apart, clamp D, upon section A, shall be the unit point, and clamp H, upon section B, shall be the movable point for holding the required mandrils.

When the abutments of a bridge are more than 7 mm. or less than 10 mm. apart, clamp D, upon section A, shall be the unit point, and clamp G, upon section B, shall be the movable point for holding the required mandrils.

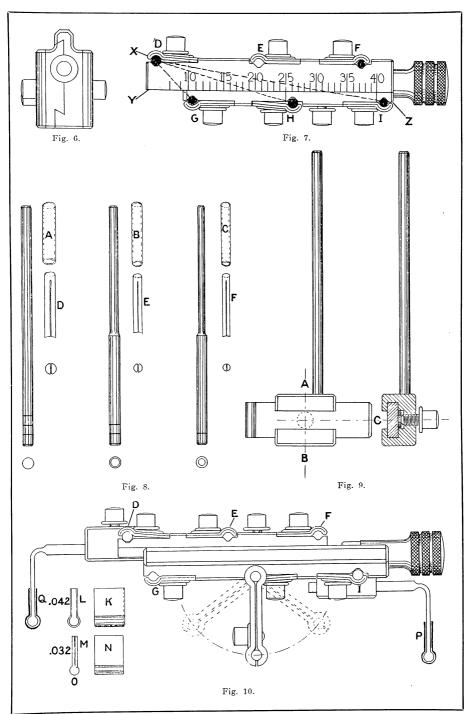
When any two points more than 40 mm. and less than 55 mm. apart are to be paralleled for attachments, clamp F, upon section A, is to be used as the unit point, and clamp G, upon section A, is to be used as the movable point for holding the required mandrils.

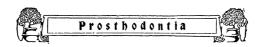
X, Y, Z, is a right triangle, of which X, Z, is the hypothenuse and Y, Z, the base.

Base Y, Z, carrying mandrils, and being the movable section, is bringing these mandrils nearer to or further away from the mandril held at unit point clamp D, at apex of the hypothenuse. It must be seen that here we have X, Z, hypothenuse being measured in terms Y, Z, base.

The more closely G, H, I, approaches clamp D, the more number of turns of the actuating screw, C, will it require to complete a mm. distance. Hence we have a constantly increasing number of micro mm.







divisions to each mm. as the distance between bridge abutments decreases.

Fig. 8 presents three mandrils, 13-14 and 15 gauge (Brown & Sharp). They are used for carrying platinum tubes, A, B, C, of corresponding diameters, the walls of these tubes are .007 of an inch in thickness.

These mandrils are locked into the body of the parallelometer, one on each section, into clamp D, on section A, and into clamp G, H, I, as the case may call for on section B.

They are always perpendicular to the horizontal plane of the meter, and the tubes placed upon these mandrils will therefore be parallel to each other.

As the actuating screw, C, is turned forward or backward, the distance between these mandrils will be decreased or increased, as the case may be.

Split pins, rendered somewhat eliptical in form, made of iridioplatinum or highly platinized clasp metal and of corresponding diameters, frictionally engage the platinum tubes and form the retentive part of what is known as the split pin and tube attachment (Fig. 8, D. E. F), used on upper cuspids and centrals and lower cuspids.

Fig. 9 shows the mandril to be held in the parallelometer for carrying an attachment used on posterior teeth.

By virtue of its construction, as seen at A, B and C, it is capable of adjustment in horizontal, vertical and circular directions.

Fig. 10 shows the parallelometer holding two of these mandrils, one in clamp D, section A, and one in clamp I, section B.

It also shows a top and side view of the platinum hood, K and L. The outside measurements of its width is .042 of an inch, and a top and side view of the plate, or male part of the attachment, M and N. The outside measurements of its width is .032 of an inch.

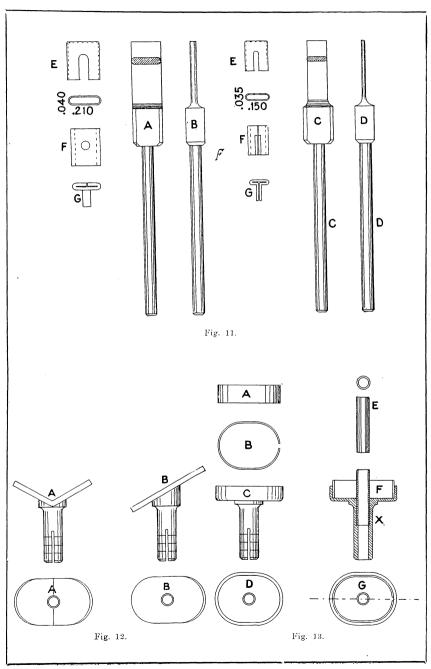
The male part of this attachment is made of two plates of highly platinized clasp metal, keyed at the distal end, O, and is the part of the attachment which is affixed to the bridge, while the hood portion is placed into the crown or an inlay to be cemented onto or into the tooth acting as the abutment.

P and Q show the manner of slipping the platinum hoods over the mandrils and carrying them into parallel relation to each other, and placing them into the abutments in such relation.

Fig. 11 shows at A and B, and C and D, the mandrils for carrying what is known as the bucco-lingual attachment, A and B for molars and C and D for bicuspids.

When there is no pulp involvement of any kind in the teeth which are to be used as piers for a bridge, these bucco-lingual attachments may be used with perfect safety without resorting to pulp extirpation. In







such cases, cavities are prepared in these teeth and inlays are made for these cavities, and it is onto these inlays that the female parts of these bucco-lingual attachments are secured.

The attachment is .210 wide and .040 of an inch thick for molars. .150 of an inch wide and .035 of an inch thick for bicuspids and varies in depth as the linear height of that tooth gingivo-occlusally which is to carry the crown or inlay when it becomes the abutment for a bridge. The attachment consists of a remale part or platinum box.

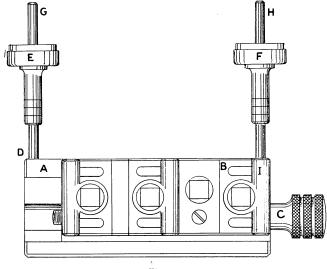


Fig. 14.

E, E, this is slipped onto the mandril, held in the parallelometer and carried to its position upon the model for the bridge; a male part consisting of a double plate of highly platinized clasp metal, F, F, which fits into the platinum box and which plate is to form a part of the bridge.

F, F, are mechanical drawings of the male portions of the large and small attachments; G, G, are cross sectional views of them.

Upon completion of the bridge, the lingual, buccal and gingival sides of the male parts are filed to produce an arc of varying degree, the extent of the arc to be determined by the condition of the underlying mucosa. Each one of these sides will touch the straight sides of the box or female part at one point only. We shall thus have an arc tangent to a straight line, which arc will be brought into activity whenever the bridge will be subjected to any lateral stress.

Figs. 12 and 13 show a series of impression trays for co-acting with



the mandrils shown in Fig. 8. A in Fig. 12 is a tray used to obtain a Taggart wax impression of a root-end.

The tray, made in as many sizes as the number of straight mandrils provided with the parallelometer, is slipped over the mandril and will frictionally engage any part of the mandril it may be at. The platinum tube is then slipped upon the mandril. The tray is brought up to meet the tube, which will enter part way into the friction sleeve.

Taggart wax is then placed directly upon the tray and around the tube. The mandrils, carrying tray, wax and tube, held in the parallelo-

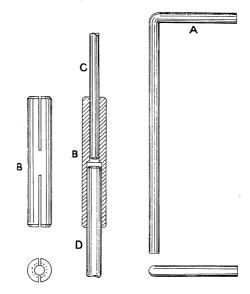
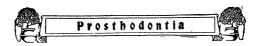


Fig. 15.

meter, are now placed into the roots, and the trays are forced up so as to bring the wax into the countersunk root-canal and onto the root surface.

B, in Fig. 12, shows a tray used in like manner for obtaining a wax model of a lingual cavity in an anterior tooth, so that a lingual inlay carrying a platinum tube may be constructed.

Fig. 13 presents views of frictional impression cups, which fit over the straight mandrils and serve for taking impressions in plaster or compound, of root-caps on anterior roots and platinum tubes in proper relation to each other. A is a view of the split band which forms an inner removable collar in the cup. B is a cross section of this band. C shows the cup and friction sleeve. D, the enlarged part of the friction sleeve, which is to be partly occupied by the platinum tube. E shows the platinum tube before it slips into the friction sleeve. F is a cross section of



cups, removable collar and platinum tube stopped at a definite shoulder within the sleeve. G shows the various members, cup, collar, sleeve and platinum tube concentrically arranged. Fig. 14 shows the parallelometer holding one mandril at clamp D, section A, and another mandril at clamp I, section B.

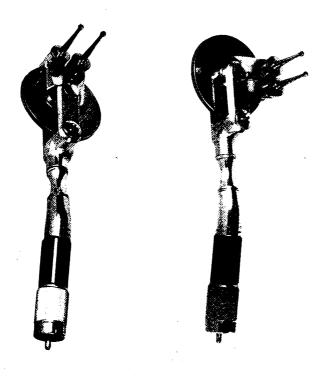


Fig. 16. Fig. 17.

Assuming that the canals in two cuspids have been made parallel, in a manner to be subsequently described, and assuming that two rootcaps have been properly made for the two cuspid roots, two friction impression cups are slipped over the mandrils to be followed by two platinum tubes, G and H.

A thin mix of plaster is placed into each cup, and the instrument, carrying mandrils, cups, plaster and tubes, is now so placed into the mouth that the tubes upon the mandrils will enter through the perforated floor of the root-caps upon the roots and slip up into the canals.

The cups are now brought up toward the roots and an impression is obtained of root caps and platinum tubes in proper parallel relation to each other.

When the impression material has set, the parallelometer is removed from the mouth and with it in the little friction cups will come the platinum tubes and root caps.



Fig. 18.

A mix of refractory compound is made, and with a small brush it is painted into the root caps and around the tubes until a mound of sufficient size has been built up.

When this compound has set, clamps D and I are opened and the body of the instrument is removed, leaving the mandrils, cups and removable collars still with the root caps and tubes imbedded in plaster and refractory material.

The mandrils are carefully turned and brought out.

The cups are pried off and the removable collar will spring apart. The plaster which surrounds the root caps and tube is now in full view

Graphite points, equal in size to the mandrils which have been used, are now inserted into the platinum tubes, and these are joined to the root caps with 22 or 20 K solder.



The soldered caps and tubes are now cooled, cleansed, filed and polished.

The mandrils are reclamped into the parallelometer at clamps D and I, respectively.

The platinum tubes and root caps are now mounted upon the mandrils and are to be cemented, one at a time, in a manner to be outlined in detail in subsequent articles, covering specific cases.

If the technique is followed out as directed, it must be apparent that the tubes carrying caps will be perfectly parallel to each other.

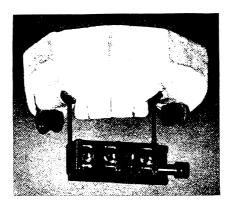


Fig. 19.

Fig. 15 presents at A the view of an angle mandril to be used in the parallelometer, for placing buccal tubes upon anchor bands in orthodontia cases in such manner that the expansion or retaining arch may be slipped into position without binding at these points.

B and B, C, D, shows an auxiliary friction tube in the act of engaging a mandril at C and a clasp metal post at D.

The mandril C would be held in the parallelometer at the clamp any particular case may call for. Another mandril would be held in another clamp of the meter, upon the other section, A and B, as the case may be. The post D may then be deposited at whatever place it is called for upon the crown or inlay and waxed thereto in perfect parallelism to the other mandril.

The clamps may then be opened and the meter removed. The mandril, C, and auxiliary tube, B, are now slipped off from the clasp metal post, D.

The crown or inlay to which it is waxed may now be imbedded in refractory material and the post and crown or inlay may be joined with solder.

Fig. 16 shows the parallelodrill, with drill heads 7 mm. apart.

The parallelodrill is a dental engine accessory which co-operates with the parallelometer in such a manner that any linear variation from 7-35 mm. may be transferred from the parallelometer to the parallelodrill.

The latter is then slipped onto the handpiece of the engine, the drills or reamers are inserted, and the root canals, which are to be paralled to one another, may be reamed out at the same time.

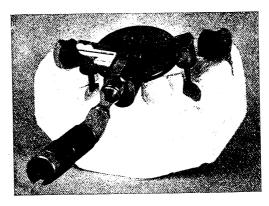


Fig. 20.

Let us assume that we wish to parallel two cuspid roots, and that the ends of the roots have been properly filled.

Two mandrils, as shown in Fig. 8, either 13 or 14 gauge (Brown & Sharpe), as the case may require, are now clamped into clamp D, on section A, and clamp I, on section B, respectively, Fig. 1. The actuating screw, C, Fig. 1, is now turned toward the operator, when section B is held innermost.

The mandril at I, Fig. 1, will gradually and with constantly diminishing speed approach the mandril at D.

From time to time the two mandrils held in the instrument are brought up to the root canals of the teeth to be used as piers.

When the distance between the two mandrils is equal to the distance between the orifices of the two root canals, so that the mandrils will just enter or be caught in the orifices, the parallelometer is locked by means of a key provided at X, Fig. 1.

The mandrils are now unclamped and two short studs are placed and clamped into the parallelometer in their stead.

The two heads of the parallelodrill are now spread apart so that they will slip over and onto the two pyramidal-shaped studs.



The studs will fully engage the two spaces provided in the heads of the drill so that no variation in linear distance is possible.

At this time the distance between the two drill heads of the parallelodrill is fixed by a locking device provided at the centre of the large gear.

The studs are unclamped from the parallelometer and then removed from the drill heads.

Two twist drills, as much larger in diameter than the mandrils as are the platinum tubes, are now inserted into the drill heads; the parallelodrill is slipped onto the engine handpiece, the power is turned on and the twist drills are allowed to work their way into the canals of the two cuspid teeth to be used as piers.

In this manner both canals are reamed out to the size required, and they will be parallel each to the other. The minimum amount of tooth structure is sacrificed and the physical integrity of the roots is never made doubtful.

Fig. 17 shows the parallelodrill with heads set at an angle of 90 degrees for the purpose of drilling or grinding into two teeth at once. In this position it may be used on the right lower or left upper jaw. The large gear will effectually hold the tongue out of the way.

Fig. 18 shows the parallelodrill with drill heads 35 mm. apart.

Fig. 19 shows the parallelometer holding the mandrils at the orifice of two cuspid roots.

Fig. 20 shows the parallelodrill holding a twist drill in each head, the twist drill having entered the two roots.





### A Consideration of the Question of Early Creatment of Malocclusion.

By Frederick C. Kemple, New York.

Read before the Meeting of the American Society of Orthodontists, Toronto, July, 1914.

During the past ten years the question of the proper time to begin the treatment of malocclusion has received attention and discussion mainly, if not entirely, from but one viewpoint, *i. e.*, that favorable to so-called "early treatment." During this decade the orthodontist has both preached and practiced "early treatment"; appliances have been placed on the teeth and the operation for correcting malocclusion begun at what he considered the "first manifestation of malposition" of the teeth.

Prior to this decade, during which the propaganda for early treatment has become so strong there was a period in which parents were instructed to wait until the child had all of the permanent teeth (except third molars) fully erupted. Some text-books gave the interval between the ages of twelve and eighteen years as the most favorable time for treating these deformities. During the present crusade for early treatment, cases are recorded in which this work was started for babies as young as two and a half years of age. Thus, within the short span of a few years, orthodontia, on the question of "proper time for treatment," has gone from one extreme to the opposite; from the adult, as the proper time to begin treatment, almost to the infant in arms.

In the opinion of the writer, this propaganda for early treatment, in the large majority of cases, is just as extreme and just as radically wrong as the previous theory for delay was erroneous and injurious. In the present paper it is my purpose to consider the question of "proper time



for beginning treatment" from a standpoint intermediate, between these two extremes. I do not wish to place myself on record as being opposed to all early treatment—I have some patients as young as four and five years of age—but I do wish to express an emphatic and absolute opposition to unnecessary treatment, and also to unnecessarily prolonged treatment for young patients, and by "young patients" I mean children under eight or nine years of age.

There can be no fixed rule for the time to begin treatment made which will be a safe guide to follow in all, or even in the majority of cases. Conservative judgment, born of careful observation and experience, must always be the safest foundation upon which to base our decisions.

### Arguments in Favor of Early Creatment.

The reasons for delay which were given a few years ago have been so completely exploded that it is unnecessary to even touch upon them in this discussion. Also the arguments adduced in support of the early treatment propaganda are quite familiar to

all of us and need only be mentioned, viz., "the ease with which teeth are moved in early life," "growth and repair most rapid at this time," "stimulating development," "aiding Nature," "guiding erupting teeth," "inducing bone growth," "increasing the width of the nasal spaces," "insuring greater regularity in size and position of the antra and of all the other sinuses of the face," etc., etc. It has even been stated in a recently published paper that the size and shape of the sella turcica, the seat of the pituitary body, may be changed by widening the upper dental arch.

Many of these arguments are of insignificant importance. For example: We can move teeth almost as easily at ten years of age as we can at six—there is not enough difference in the amount of pressure required at the two ages to be worth a moment's consideration; and the rate of growth and repair at ten years of age may be as rapid as at any earlier age so far as we are able to judge—at least the rate of growth and repair at ten is sufficiently rapid for orthodontic purposes. Also in our zeal to "aid Nature" we may rush to her assistance in many of these cases at a time when she would be much better off without our ministrations.

There are some of these arguments, however, if supported by acceptable clinical evidence, that would be very good and sufficient reasons for beginning our treatment at almost any early age; the earlier, probably, the better. But, unfortunately, the more important in this catalogue of reasons are but bare assertions; they are statements of what we would like to believe might take place, but they are not supported by adequate clinical facts. They are purely presumptive. For example: We do

not know that the bony structures which underlie the alveolar process are stimulated to any greater or better development through orthodontic measures than they would be without it; it has not been shown in any definite manner whatsoever that gentle pressure on the teeth at an early age, or at any age, will cause an increased growth of bone beyond the immediate region of the alveolar process.

Nor have we been able to demonstrate that the width of the nasal spaces can be increased in the slightest degree by even the most extensive widening of the upper dental arch.

Also there is not an atom of demonstrable evidence to indicate that early treatment will in any manner affect the size or position or shape of the antra or of any of the other sinuses of the face. Statements to the contrary are presumptive, and are founded on hypothetical reasoning, and not on observed facts.

If the form or structure of the maxillæ or mandible can be changed by changing the position of the teeth, we might naturally assume that the general shape and contour of these bones, in cases wherein the teeth have not been disturbed by artificial movement, would bear some definite relation to the contour of the dental arches. An examination of a number of skulls, however, will hardly bear out this assumption. Narrow, constricted and crowded dental arches may be frequently found perched upon well-developed mandibles—and frequently the upper anterior teeth are decidedly prominent in relation to the maxillæ proper, which conditions certainly indicate that there is not a definite and fixed relation existing between the two.

It is true that well-formed facial bones usually accompany normal, well-developed dental arches, but this does not signify that the degree of development of these bones is necessarily dependent upon the form of the dental arches. It might rather indicate that the same forces working for normal growth were active in both parts.

Relation of Dental Arch to Nasal Space. Also, if the width of the nasal spaces is increased in conformity to the degree of expansion produced in the upper dental arch in treating malocclusion, it would be reasonable to expect all normally wide dental arches to be accompanied by rela-

tively wide nasal spaces; and, conversely, narrow upper dental arches to be associated only with narrow nasal spaces. But the direct reverse of this relation is frequently found to exist. I recently examined a few skulls from Dr. M. H. Cryer's collection, and among this small number there were four in which the upper arches and nares measured as follows:



Skull I. Measured from the mesio-buccal cusp of the second molar across the arch to the mesio-buccal cusp of the opposite second molar 2.13 inches. The nasal space in the same line measured 1:52 inches.

Skull 2. Measured from the mesio-buccal cusp to the second molar



Fig. 1.

Fig. 1 is made from a skull with a very wide arch and a narrow compressed nose. The outside measurement of the arch is 66 mm. The nose should be 35 mm. but is only 20 mm. It will be noticed that the maxillary sinuses are very large, which is usually the case where the nose is so narrow. When the nose is wide the antra are often small, or may even be undeveloped. (Cryer.)

across the arch to the mesio-buccal cusp of the opposite second molar, 2.58 inches. The nasal space in the same line measured 1.34 inches.

Skull 3. Measured from the mesio-buccal cusp of the first molar across the arch to the mesio-buccal cusp of the opposite first molar, 1.76 inches. The nasal space in the same line measured 1.42 inches.

Skull 4. Measured from the mesio-buccal cusp of the first molar across the arch to the mesio-buccal cusp of the opposite first molar, 2.36 inches. The nasal space in the same line measured 1.31 inches.

In No. 1 and No. 2 the measurement was from the second molar across the arch to the opposite second molar. In this region the arch of No. 2 was .45 in. wider than in No. 1, while the nares of No. 1 was .18 in. wider than in No. 2.

In No. 3 and No. 4 the measurement was from the first molar across the arch. In this region the arch of No. 4 was .60 in. wider than in No. 3, while in No. 3 the nares was .11 in. wider than in No. 4.

These are examples of wide dental arches being accompanied by narrow nasal spaces; and of narrow dental arches accompanied by wide nasal spaces. In speaking with Dr. Cryer about this condition, he

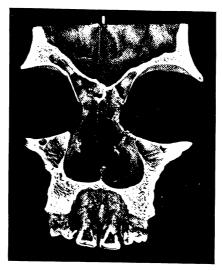


Fig. 2.

Fig. 2 is made from a skull showing one of the narrowest arches in my collection. The width of the arch across the outside of the second premolars is but  $44 \, \text{mm.}$ , while the floor of the nose measures  $35 \, \text{mm.}$ , one of the widest 1 have at this point of measurement. (Crycr.)

expressed the opinion that the width of the nasal spaces probably is governed more by the size of the antra than by the width of the dental arch. In an excellent paper read before this society, in Chicago, in July, 1912, Dr. Cryer called attention to this non-conformity in size of dental arch and nasal space, and showed pictures of several skulls illustrating the lack of definite relation in these two regions. Two of the illustrations used by him at that time are here reproduced in Figs. 1 and 2.

At the request of Dr. Kemple, the following report of a case from practice is appended. Patient was referred by one of the most prominent rhinologists with the following statement:



Fig. C. (Radiograph by Schamberg.)

Radiograph showing condition in living patient similar to those shown by Cryer in the skull seen in Fig. 1. Very wide arches with exceedingly narrow nasal space. For proper comparison remember that this radiograph is not reduced while Cryer's figure is about half size.

"This boy has the narrowest nasal spaces that I have seen. Would it be possible to increase his capacity for nasal breathing by widening his dental arches?"

An examination disclosed exceedingly wide, well-formed dental arches, which if anything were over-wide, as spaces existed between several teeth in both arches.

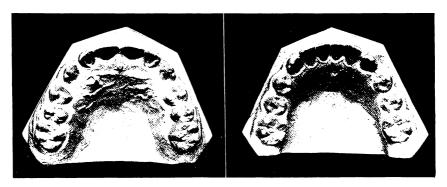


Fig. A. Fig. B.

Figs. a and b show occlusal views of the upper and lower casts.

Fig. c is from a radiograph taken through the skull and shows the comparative width of the nasal spaces and the dental arches. The radiograph is interesting for comparison with Dr. Cryer's sections of skulls, because here we have disclosed a condition as it existed in life.

R. Ottolengiii.

Also, in listening to these witching arguments that we should aid Nature at the very earliest opportunity, many of us are likely to lose sight of one of the most important facts in biology, viz., that Nature is constantly making an unremitting effort to overcome her own defects. Another important fact that should be kept in mind before embracing the "early treatment" doctrine, as a rule for all cases, is, that we have not yet arrived at that degree of skill in diagnosis of malocclusion where we can always be able to say with nicety just what is normal and what is abnormal in deciduous and mixed dentures. These are important facts, and are worthy of serious and conservative investigation before attempting to sweep them aside by any course of inductive or deducative reasoning.



## Possibilities of Development.

In viewing early treatment by this light I am not detracting one jot or tittle from the true value of orthodontia as an important element in the healing art, nor from the value of early treatment when its

need is really indicated. The real worth of orthodontia as a factor in the physical and mental development of the child has been amply demonstrated. Its benefits to hundreds of children are evidenced on every hand. But, like every good thing, orthodontia, in my opinion, is being overdone through this inordinate propensity for early treatment. I sincerely believe that a large percentage of the cases that are now being treated at five and six and seven years of age would need no treatment whatever if the beginning of the operation were deferred until the child had reached the ages of nine or ten years. I claim for orthodontia all credit that rightfully belongs to her, but I also wish to give Nature a fair chance to do her work in her own mysterious way.

In the discussion of a paper read before this society a few years ago, Dr. L. S. Lourie, of Chicago, expressed himself as follows:

## Dr. Courie's Uiews.

"I think we will have to change our mode of observation before we can determine what is the normal width and size of the arch at various ages. . . . . I do not feel that I am justified in expanding

deciduous arches to make them the width that the permanent arch is going to be. I frequently notice that the bicuspids and cuspids are developing in the process quite a bit buccally to the position of the deciduous arches, and I do not see the object of disturbing the deciduous arches for the purpose of causing the bicuspids and cuspids to come in buccally, as they will do anyway in a large percentage of cases."

Last year at Chicago Dr. Dewey, in his discussion of Dr. Young's paper, used this language:

### Dr. Dewey's Uiews.

"Because you do not find spaces between the deciduous teeth at six is no proof that they will not be there at six and a half years of age. Individuals develop at different ages. A condition at the age of

six may be normal for that individual, and in the next youngster at six and a half a similar condition would be normal for that age."

Dr. Dewey could have extended the time six months at each end, making the range a year and a half instead of six months, and he would still have been well within the realm of fact.

If there happens to be a marked insufficiency of space for the permanent incisors, even when these teeth come through the gum, it is not proof that there will not be sufficient development to accommodate them in proper alignment and position by the time they are fully erupted.

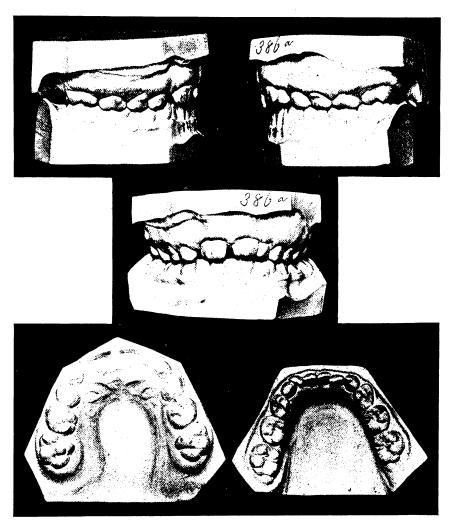


Fig. 3.

Every dentist of experience has observed incisors "straightening themselves." In one of the early editions of Dr. Angle's work he gives this bit of wholesome advice:

Angle's Advice. "Studiously avoid needless interference in those cases where it is apparent that Nature will, unaided, correct the deformity; but take professional pride in encounters with the interlocked, twisted and over-



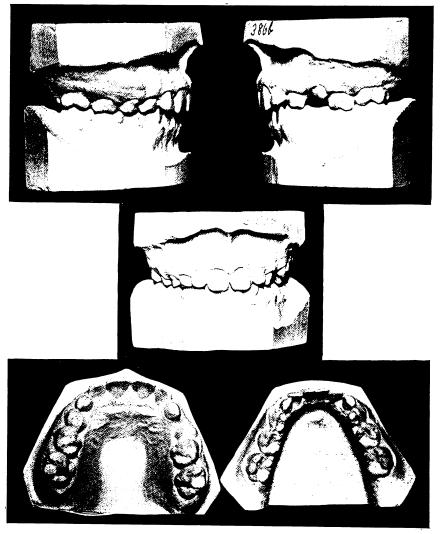


Fig. 4.

lapped, or otherwise malposed teeth, which usually become worse and complicate the condition of the teeth yet to be erupted."

These were golden words, and are worthy of a place over the working cabinet of every orthodontist. But, unfortunately for all students of orthodontia, and particularly for the young orthodontist, these invaluable words of caution and warning have been, either studiously or inadvertantly, omitted from all later editions of this work.

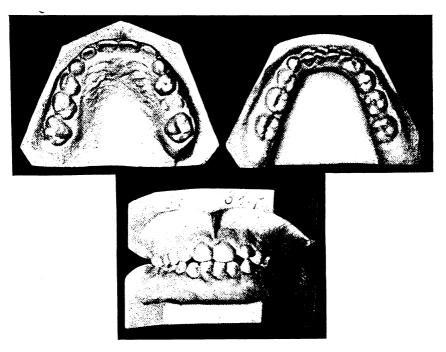


Fig. 5.

### Study of Early Malocclusions.

There are many cases in which the malocclusion in very young children is more apparent than real, and in which the natural tongue and lip pressure are often as effective in correcting the doubtful deformity as would be the expansion arch, ligatures,

etc. The forces of normal tongue and lip pressure, which are constantly active, will often bring malposed erupting teeth into alignment and proper occlusion. This is particularly true of cases where the lower permanent incisors may be erupting in a lingual position, and where the arch may or may not be slightly narrow. The lower incisors frequently peep through the gum in a position considerably lingual to normal in spite of the fact that there may have been ample room for them to have assumed their proper places in the arch. Other cases which Nature will often succeed in correcting, are those in which the upper incisors are more or less out of alignment while erupting, with the arch slightly constricted, or not, as the case may be.

But suppose Nature of herself is unable to complete the corrective operation in these cases, suppose there is some obstacle interfering with her efforts to such a degree that she must have the assistance of an



orthodontist to complete the work. Such slight malocclusion is probably not causing the child the least physical or mental injury, nor even inconvenience; and is it too late at nine or ten, or even eleven years of age, for the orthodontist to finish the work in such cases? In these instances, if he will be patient and wait a few years. Nature may surprise us with her accomplishments in orthodontia; and if she does not, if Nature has not succeeded in correcting the malocclusion, we have not lost anything by waiting. The case can probably be corrected as easily, or more easily, perhaps, at ten years of age than it could have been at five or six or seven.

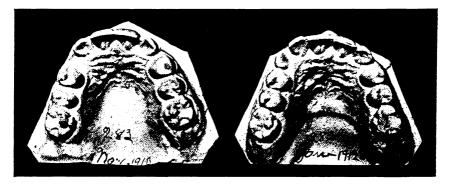


Fig. 6.

An early start, according to the doctrine of "guiding such erupting tooth," usually involves carrying the treatment over the entire period of transition from the deciduous to the completion of the permanent denture, which means that the child must wear appliances on the teeth more or less continuously for five or six or seven years to accomplish what could just as well have been effected at a later age, and with much less effort in two or three years or less.

In those cases in which it seems necessary—or even desirable—at six or seven years of age, or even younger, to relieve an excessive malocclusion which may be interfering with the child's ability to masticate, or to breathe properly, or which may be in any wise affecting the health injuriously, such a case, in my opinion, should be relieved immediately. But relief in these cases does not imply the necessity of restoring ideal occlusion of the deciduous teeth; and it certainly should not indicate the beginning of an operation that must be continuous and uninterrupted over a period of six or seven years. The interference with the child's physical or mental development, which may be caused by the malocclusion, can probably be removed by restoring a fair amount of masticating surface and producing sufficient expansion of the arches to make room

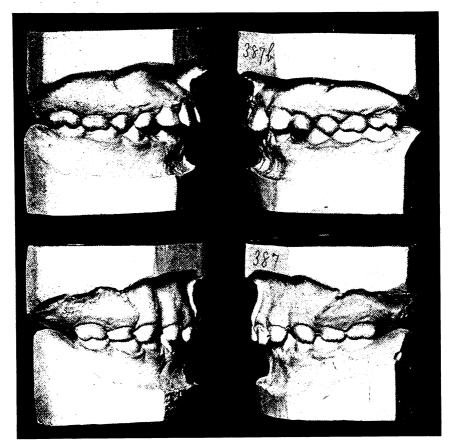


Fig. 7A.

for the tongue to occupy its proper position, and to relieve any constriction of the nutrient vessels or nerve channels that may have resulted from an excessively narrow arch. This effect can usually be accomplished by a few months of treatment, and the case can then be practically dismissed until the child is eight or nine years of age. After such an interval of waiting, during all of which time Nature has been unhampered and uninterfered with in her efforts, the treatment can again be taken up and carried to completion. Treated in this manner the case will, in all probability, be finished just as soon, according to the calendar, as it would have been had the treatment been carried along continuously from the beginning. The interval of "watchful waiting" has not been lost, but can be counted as time saved for the patient, the parent and the





Fig. 7B.

operator. The period of treatment under such circumstances will probably cover two or three years, instead of six or seven.

In my opinion, the percentage of our cases that really require this very early treatment for the relief of retarded physical or mental development is very small in comparison with the whole number who are afflicted with malocclusion. Probably ninety per cent. or more of the patients who present to any of us for treatment will measure up to the average child of their age in height, weight and mental activity, their parentage considered.

Between the ages of six or twelve years children seem to thrive without the benefit of a large area of masticating surface—nature appears to have provided other means to compensate for the period of dental transition, during which time the masticating utility of the dental organs is so much reduced.

I believe each one of you will agree with the following proposition as a basic principle in orthodontia:

Final results being equal, the fewer and simpler the appliances used in the treatment of malocclusion, and the shorter time the appliances remain on the teeth, the better for the patient, the parent and the orthodontist.

This paper may be considered an appeal in behalf of our little patients for the adoption of the principle in our practice.

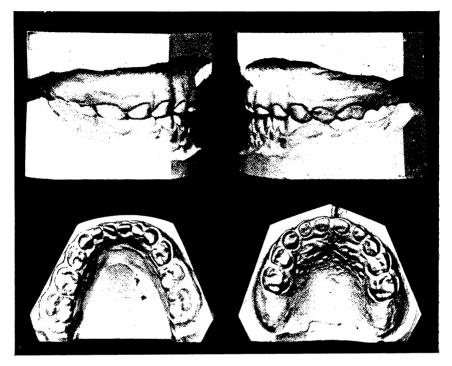


Fig. 8.

### Illustrations.

A few illustrations may serve to bring out more clearly the points which I have tried to describe: Description—"Fig. I is made from a skull with a very wide arch and a narrow, compressed nose. The outside measurement of the arch is 66 mm. The nose should be 35 mm., but is only 20 mm. It will be noticed that the maxillary sinuses are very large, which is usually the case where the nose is so narrow. When the nose is wide the antra are often small, or even may be undeveloped."—Cryer.

"Fig. 2 is made from a skull showing one of the narrowest arches in my collection. The width of the arch across the outside of the second premolar is but 44 mm., while the floor of the nose measures 35 mm., one of the widest I have at this point of measurement."—Cryer.

Fig. 3—Shows the front, side and occlusal views of the mouth of a boy, aged seven years and seven months. The upper central is .35 of an inch in width; the arch, both upper and lower, are perceptibly narrow; the upper centrals are abnormally spaced; and the room for the permanent laterals, which have shown no sign of erupting, is constricted to



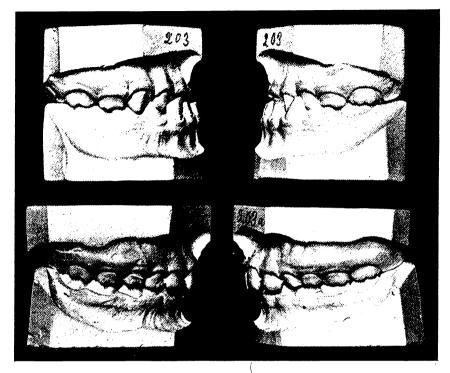


Fig. 9.

about half what it should be. The lower incisors are markedly crowded and out of alignment, and the arch is narrow.

Fig. 4—Shows the front, side and occlusal views of the same mouth two and a half years later, at the age of ten years and one month. The four upper incisors are in practically perfect position and alignment. The laterals, which are .25 of an inch in width, have forced themselves into the constricted spaces which were only .10 and .19 of an inch, respectively; the space between the centrals has closed in a perfectly normal manner; and the four incisors occupy 1.14 inches of space between the canines, which is .20 inch increase during the eruption of the laterals.

This one instance in itself tells a wonderful story of what Nature can accomplish in many of these cases if allowed to do so in her own way. When this boy was seven years of age, circumstances over which the parents had no control, made it practically impossible for them to give the time necessary for the treatment of the case, and much to their regret at the time and the regret of the orthodontist the work had to be indefinitely postponed. But it was postponed with the parents under-

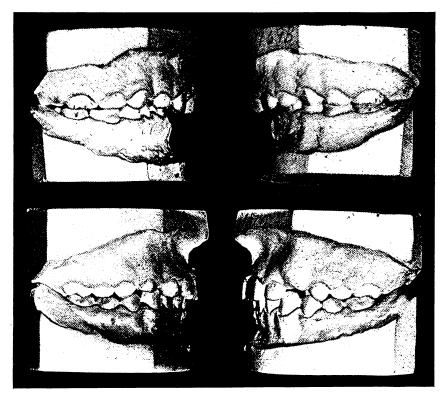


Fig. 10A.

standing that the malocclusion would grow worse and that later the treatment would involve more time, be more difficult and more expensive. The case, however, was never treated in any way, and to-day, at ten and a half years of age, the occlusion is practically perfect, and no amount of treatment in two years and a half could have bettered the result that Nature has accomplished unaided.

Fig. 5—Shows the occlusal and front views of the mouth of a girl, aged nine years. When this child was about three years of age the parents were advised to have the ligament between the two upper front teeth burned out and the teeth drawn together. Later, when the child was about six and a half or seven years of age, they were again advised to have the arches widened and the front teeth straightened—the lower incisors were crowded and the arch was slightly narrow. The parents neglected to have the work done, the case was never treated, and to-day the child's teeth are practically normal, except for a very slight narrowness in the lower canine region.



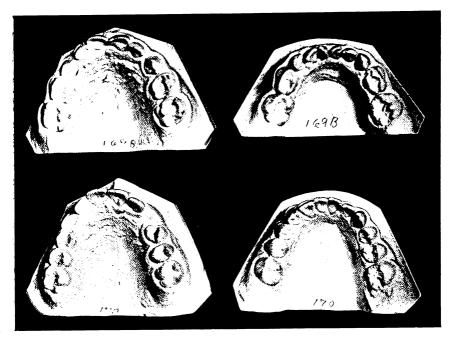


Fig. 10B.

Fig. 6—Shows where a right upper canine .30 of an inch in width has forced itself into a space .15 wide by pushing the other teeth aside without greatly disturbing their alignment.

Figs. 7A and B—Show the "before and after" models of a child who has been under treatment for five years, and who still has appliances on the teeth. The original model, so far as I am able to diagnose the condition, was practically normal, and, I believe, if the case had never been treated in any manner the result would be better than it is now after five years of treatment.

Fig. 8—Shows a somewhat similar condition in the mouth of a child between six and seven years of age. The upper arch is well developed, the deciduous incisors and canines are spaced and the arch is to all appearances normal. The lower arch is slightly narrow in the region of the incisors and canines, but very slightly. The parents have been advised to have these arches expanded and the lower central incisors rotated. If it were my own child I would not think of disturbing the natural development that is taking place there at this time.

Fig. 9—Shows the casts of the mouth of a child six years of age, and indicating a very decided tendency toward a Class III condition. I felt

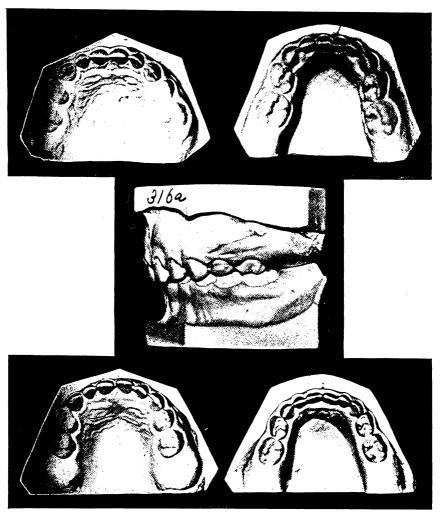


Fig. 11.

that this malocclusion should not be allowed to continue, and therefore treated it immediately. Within about six months the result was most satisfactory; all retainers were removed and the deciduous teeth remained in nice position, but when the permanent teeth began to appear the lower incisors erupted quite lingual to the deciduous ones, and as the transition progressed there was a gradual drifting toward what you see in the second set of casts, a subdivision of Class II. As I see this case now



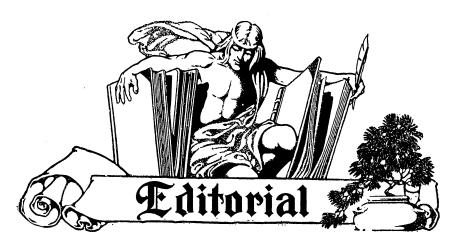
I have no assurance that the permanent teeth, had it not been treated at all, would have erupted into a Class III position; neither is there evidence that any harm would have resulted from a delay of two or three years; perhaps they might have erupted normally, instead of drifting into the position as shown; who knows?

Figs. 10A and B—Show the casts of a Class II case that I began to treat when the child was a little past four years of age, and I have been treating it more or less ever since, which is about six years. This does not mean that the teeth have had appliances on during all of this time, but that they have been under supervision for this length of time. The arches in the original casts were fairly well developed and the child had a fair amount of masticating surface, and the child was therefore not suffering physically from the malocclusion. In such a case to-day I would postpone treatment till a later age, with the feeling that the same result could be accomplished with a less expenditure of time and energy for both the patient and the operator.

Fig. II—Shows the case of a child five years of age, in which the teeth of the lower arch closed entirely inside of the upper; there was no masticating occlusion whatever. Here is a case in which I believe very early treatment is advisable in order to give the child a fair masticating surface. The lower arch was expanded, and the upper arch was contracted slightly, which brought the molars and canines into occlusal contact and gave the child a masticating occlusion. The teeth were retained in this position for a short time, and the case was dismissed for a period of two or three or four years; or, in other words, treatment is to be taken up again at any time when it seems to be needed. The side view shows the position of the teeth, mesio-distally, as they were when treatment was discontinued. I left them in Class II malocclusion.

Gonclusion.

I am firmly convinced that a large percentage of the treatment of cases of co-called malocclusion in the mouths of young children is entirely unnecessary, and that in many of these cases Nature without interference could and would do the work far better than any orthodontist could possibly do it.



## Che Role of Endamoeba Gingivalis in Pyorrhea.

In the issue of the *Journal of the American Medical Association*, of the date of February 13th, the leading article is entitled "Pyorrhea Dentalis and Alveolaris," over the signatures of Drs. Bass and Johns, the bacteriologists of New Orleans.

It is unfortunate that men at times overlook the fact that their prominent position in the profession adds an authoritative note to their utterances which should cause them to be most cautious in voicing new theories in regard to the etiology and treatment of disease.

The Announcements

of Bass and Johns.

announce that:

In their communication to the *Journal of the American Medical Association*, Drs. Bass and Johns announce that:

"The specific cause of pyorrhea dentalis and alveolaris is endamœbas."

These are the most remarkable ten words that the writer has ever read in medical or dental literature. In this one and a half lines of type the writers not only dogmatically close all discussion as to the etiology of pyorrhea, a discussion, by the way, that has been continuously carried on for a quarter of a century, but at the same time they give us a new classification, with a new name for the earlier phases of the disease. Verily this is quite an accomplishment. A contribution to classification, terminology, and etiology, all expressed in ten words.

The dental profession has long criticised the term "pyorrhea alveo-



laris," "pus from the alveolus," because pus from the alveolus is not always an expression of the particular lesion which the term is supposed to describe. Now these medical authors present to us a new term, "pyorrhea dentalis," "pus from a tooth," a symptom which is never present in the disease under discussion. With full recognition of the previous valuable services of these gentlemen, and of the prominence in the medical profession which they enjoy, indeed because of these very facts, the writer respectfully protests against the introduction of this new term, "pyorrhea dentalis," as likewise does he protest against the dogmatic statement without adequate proof that the "specific cause of pyorrhea alveolaris is endamœbas."

Already this article has caused the injection of emetin into the systems of hundreds of human beings; already this article is quoted in commercial advertisements to help the sale of emetin, ipecac and preparations thereof; already the men of trade have placed on the market surecure tooth pastes and tooth washes containing ipecac and guaranteed to prevent or cure pyorrhea alveolaris; already dental incompetents who had abandoned the treatment of pyorrhea alveolaris, and had adopted the habit of referring sufferers to men of skill, are now resuming the treatments of the disease, adopting the recommendations of Drs. Bass and Johns and assuring the patients that at last the problem has been solved.

But has it?

It is the view of the writer that the problem of the cure of pyorrhea alveolaris has not yet been solved. It is likewise his opinion that the rôle of the endamœba has not yet been sufficiently proven, nor even studied, to warrant the assertive statement by Drs. Bass and Johns, and the conspicuous publication in so important a magazine as the *Journal of the American Medical Association*, of the claim that "the specific cause of pyorrhea alverlaris is the endamœbas."

Premature announcements of this sort, widely copied into the lay press, raise hopes and expectations on the part of the public which, when unsatisfied and unfulfilled, undermines the faith of patients in practitioners, both of medicine and dentistry.

Announcements of, Barrett and Smith.

Much more conservative, much more cautious, and we think for these reasons much more scientific, have been the communications on the same subject By Drs. Barrett and Smith, as expressing perhaps

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the best present thought on the subject the following quotations are made from a paper by these authors read before the Toronto Dental Society, March 8th, and published in the April issue of *Oral Health*, a careful study of which is recommended to all interested in the subject.

The following language is in strong contrast with the brief assertion by Drs. Bass and Johns. Drs. Barrett and Smith tell us that:

"It should be acknowledged here that no proof exists to-day that these oral endamæbæ are the sole specific cause of the large group of pyorrhea lesions in which they are to be found. They exist in these lesions in association with a large number of bacterial species, leptothrix threads and several species of spirochaetes, and it is impossible to say that none of these associates are not also culpable with the protozoan parasites"

The writers then continue as follows:

"The proof of some (and probably an important) part of causal influence attaching to the endamœbæ rests thus far upon: (a) the constancy of their occurrence in pyorrhea pockets; (b) their absence from the mouth of control subjects; (c) and the disappearance of both suppuration and of amœbæ upon the proper employment of emetin. Of course, the associated organisms also disappear from the pockets with the cessation of suppuration, but not as completely as do the amœbæ; and while the amoebic parasites, as far as protracted search upon our part has shown, disappear completely from the mouth, many at least of the associated organisms persist in the food and salivary mixtures to be found in the gingival grooves and in other protected positions. Emetin has proved, both in vitro and in the treatment of other amoebic affections. as dysentery, to be lethal to amœbæ, even when in high dilution; its influence upon bacteria is largely unstudied, but for the few species for which it has been tested it shows but low bactericidal power, even in strong solution. It is therefore a natural and reasonable inference to hold, until proof to the contrary is presented, that these protozoan parasites, if not solely responsible, are at least largely responsible for the production of the lesions in question."

Drs. Barrett and Smith then give their present opinion of the rôle of the endamœba in the following language, which must receive respectful consideration even from the most violent opponents of the view that endamœbæ exert a pathogenic influence:

"The writers incline to the belief that they really act in symbiotic relation with some or all of the vegetable organisms with which they are in association in Nature; that by their proteolytic power they prepare a highly fitting pabulum for the growth of bacteria in the form of end

products of their digestion of leucocytes, red blood cells and perhaps fixed cells as well, and thus favor a rank mycotic growth about them; that by their ingestion and destruction of these bacteria they set free a not inconsiderable amount of bacterial toxins of different kinds and of varying influences; that these toxins are locally necrosing and of essential importance in determining and maintaining the gingival and alveolar inflammation, and, too, may be diffused and be productive of a widespread series of complications in the body of the host, commonly discussed in connection with the 'oral sepsis' of Hunter.''

The authors then refer to the fact that objection has been made "that the classic postulates of Koch have not been fulfilled, and that the claim of endamœbic pathogenicity is therefore not demonstrated," and they proceed to a defense of their position and view, well worth reading, but for which we have not space to quote. We cannot, however, refrain from republishing the following advice, because it is at once so temperate and so rational:

# Creatment Recommended by Barrett and Smith.

"The proof of their pathogenicity is not perfect, we admit, even though an efficient remedy has been provided; but the probability of the correctness of our suspicions is sufficiently established to make the assumption of pathogenicity of these endamœbæ a

credible working theory. As such it will remain until it is finally verified, or absolute proof to the contrary presented; and the writers feel that in any academic discussion or in any experimental procedures leading into discussion, at this time the burden of proof falls upon the objectors. We have at no time refused the idea that the associated bacteria are contributing factors; as above stated, we suspect they and the amœbæ are linked in a symbiotic chain—and a chain is broken when any link of it is shattered. So, thorough local antisepsis and proper vaccines may also be expected, by destroying the bacteria, to yield beneficial results; and in many cases the association of the two measures may hasten and may more certainly establish a final cure. But because of its convenience of application, its almost uniformly good effects, the absence of any painful effects upon the patient, we feel that emetin should stand first among remedial agents and measures when ordinary amæbic pyorrhea cases present themselves. There is reason to scale the teeth in connection with the treatment, but the scaling should be gently done to disturb the loosened tooth as little as possible; and indiscriminate instrumentation is painful and often is really meddlesome in that it results in mechanically breaking the wall of the pockets and further disturbing the toxic and microbic contents into the surrounding tissues. Antiseptics are surely

indicated, yet indiscriminately applied and in too high concentrations they may destroy tissue which we should endeavor to preserve. Vaccines are in theory admirable, and in practice they often realize their purpose; but their use is not always convenient, is sometimes attended by unpleasant general reactions, and they are sometimes utter failures from some fault of technique, presumably."

Che Apparently Rational Procedure. At present there seem to be no less than three distinct views. Some believe with Bass and Johns that the endamæba is the specific cause of pyorrhea. Many more will agree with Barrett and Smith that the endamæba when present exerts a pathogenic in-

fluence which may well retard cure even though it may not have been the specific causative agent. Still others adopt the opposite extreme and declare that the endamœbæ, though present in pyorrheal pockets, are harmless, and perhaps even helpful residents therein.

The last postulate seems to the writer, in the light of the communications by Drs. Barrett and Smith, even more untenable than the announcement by Drs. Bass and Johns. It would therefore seem to the best interests of the patient to at least tentatively adopt the theory of Drs. Barrett and Smith that the endamœbæ do exert a baneful influence when present. But would it not be rational before exhibiting emetin to determine whether or not the endamœbæ be present? The writer thinks so, and for this reason has solicited from Thomas Le Cléar the article published in this issue describing a method of definitely determining the presence or absence of the endamœbæ.





WELL, I HAVE a few replies; not exactly answers, but anyway replies. To

- \* what? Why to the great problem: "How can the Average Dentist
- \* properly fill a root canal, using radiography, when his patients expect
- the entire operation, including the filling of the cavity, to cost no more
- than five dollars."

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I THINK I MADE A PROMISE (or was it a threat), that if some one did

- \* not answer this question, I would answer it myself. But it begins to
- \* appear that the patient will pretty soon solve this problem for the den-
- \* tist. The following is an actual occurence; I know this because the
- \* man who related it to me is a lineal descendant of George Washington;
- \* his name is George, too, come to think of it.

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FRIEND GEORGE has a radiographic outfit. Enter woman of moderate

- \* means. Statement: "Doctor, I have a lateral incisor that is a little out
- of line, and a dentist persuaded me to let him cut it off in order to crown
- it. He killed the nerve and took it out, and then he filled the root. I
- have not had it crowned yet, because it has been tender to the touch
- \* ever since, and I would like you to tell me what the trouble is. Another
- dentist told me the first man must have perforated the root." Friend
- dentity total meet man made have personated the record
- George explained that he could not make a diagnosis without an X-ray
- picture, and that his fee would be five dollars.

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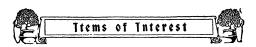
AFTER TAKING THE picture, Friend George gave an appointment for the

- patient to return for an opinion. When she called he showed her the
- \* radiograph, indicating to her the presence of a small blind abscess, and
- the absence of any root filling at the upper third of the root canal.
- The patient then asked what his fee would be to unfill, treat and refill.
- The estimate was indefinitely set at between thirty and fifty dollars.

H H

AFTER A PROLONGED study of the radiograph the woman made the fol-

- \* lowing illuminating reply: "I would like appointments for the work. I
- have an appointment with another dentist, for to-morrow morning, to
- care for this tooth, but I will cancel it, because when I told him that I



- was having a radiograph taken he told me I could 'blow' five dollars on
- \* a radiograph if I wanted to but he would not need it. That he has done
- without the X-ray for thirty years, and he guesses he does not need it.
- He also pointed out that he would only charge me ten dollars for treat-
- ing and filling the tooth, while the X-ray dentists would want more."

FRIEND GEORGE told the woman that he did not wish to have her leave

- another dentist to come to him, but she interrupted him to remark:
- "Excuse me Doctor, but I had one man fill that tooth by guess work,
- and your picture shows he made a poor guess. I am going to let you
- treat my tooth, but when you have filled the root, I want you to take
- an X-ray and let me see it."

THERE IS FOOD for very deep and very serious thought in this story, and

- a mighty good moral. Here is a woman who has an opportunity to
  - have an old reliable dentist of experience treat and fill her tooth for a
  - flat fee of ten dollars, yet she elects to patronize a man who will charge
  - her between thirty and fifty dollars. Why? Because when the radio-
- graphic process is explained to her, she immediately recognizes that the
- old way is all guess work. Moreover she stipulates that the dentist
- shall show her the radiograph of the completed root filling.

AND THAT WILL prove to be the final solution of this whole question.

- Patients will require radiographic proof that roots have been properly
- filled, before settling their accounts. When that day arrives dentists
- will no longer declare that they cannot afford to install X-ray outfits.
- They will discover that they cannot afford not to do so. And this
- brings us to the letters that have been received.

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DR. W. W. SWEENEY, of Los Angeles, states the following facts: "The

- cost of a first-class X-ray equipment, which will enable the operator to
  - take a picture in three seconds, is not over \$225.00. The interest on this
- ❖ investment at 8% per annum is \$18.00 or \$1.50 per month. Should the
- number of radiographs not exceed ten a month the overhead cost per
- film would be 15 cents each. The films cost less than 10 cents each,
- and the operator's time in exposing and developing will not exceed ten
- minutes, which figures, at the rate of \$3.00 per hour, 50 cents, and adding
- to this an outside figure of 5 cents for the developer used, gives a total
- cost of 80 cents for the production of a radiograph. To me the question
- seems to be, not 'can a dentist afford an X-ray equipment' but rather
- . 'can he afford to be without it?' and in this I am supported by such
- eminent authorities as Dr. Howard P. Raper, of Indianapolis, and •
- \* others."

THE ARGUMENTS of Dr. Sweeney are sound. In this section of the world, as men's fees vary, and as likewise the cost of the equipment may

- be more than the above quotation, the expense of making a radiograph
- has been figured out exclusive of these items of dentist's time and in-
- terest on investment, and it has been declared that 16 cents is the actual
- cost of producing a radiograph.



DR. E. C. STEINSIECK, of Hightstown, N. J., writes as follows: "I am an average dentist. Three to five dollars is all I can collect for the treatment, filling (?), of the canals and the tooth. The average physician does not perform many operations, but sends them to a hospital where proper facilities are to be had, and where some arrangement can be made for people in moderate circumstances. Could not local dental societies purchase X-ray machines and have them operated in conjunction with a hospital where members could obtain pictures at a moderate fee? Or might not one centrally located member have charge of it and arrange certain hours when patients of other members could procure pictures?"

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DR. WILLIAM MENDELSON, of Brooklyn, writes somewhat similarly. He says: "The solution seems to me to lie in co-operation. Just as farmers unite to equip and maintain a grain elevator so dentists might establish an X-ray laboratory. Suppose that one hundred dentists should contribute ten dollars each to cover the original outlay, and five dollars per month thereafter, could not an X-ray laboratory be maintained for the benefit of these subscribers only so that pictures could be obtained at a minumum cost?"

NUMEROUS OTHER communications have been received, every one of which contains some valuable thought on the general subject, but the above are the only ones that even attempt a solution of the immediate • problem. And now I must admit that these writers have between them ٠ guessed one proposition that I had to offer. There is no doubt that a • co-operative laboratory might be made of mutual advantage in reducing • the cost of radiographs. Two plans are feasible. Perhaps the simplest would be for ten dentists, approximately neighbors, to unite in furnish-٠ ing the capital needed for the equipment, and the radiographs could all \*\* be made by one man upon a mutually agreed basis. The larger scheme would be for a dental society to establish the laboratory, the members ٠ ٠ being assessed pro rata for its equipment. Accounts could then be kept ٠ with the subscribers, accurate records of the work sent to the laboratory by each being kept. Then at the end of each month, after deducting • for operator's salary, expenses, etc., profits, if any, could be divided between the subscribers in the ratio of the business furnished by each. The laboratory might even do work for non-subscribers at an increased fee; for example, one dollar for a radiograph for a patient of a subscriber to the laboratory, and two dollars for non-subscribers.

THERE IS, HOWEVER, still another co-operative plan. Mr. Ford, the automobile manufacturer, once said that if he could sell as many cars ٠ of the grade of the Packard, as he could Ford cars, he could produce a ❖ car as good as the Packard, sell it for \$1,800.00 and make a profit. A furniture dealer once explained that a glass closet for the dining room \* costs more than a bookcase, because three of the latter are sold to one ٠ of the former. When X-ray outfits were limited as to sale, to specialists in radiography, the cost of a machine was necessarily higher than even now, when there is a growing demand for an outfit that a dentist may



- buy for his own use. If the majority of dentists would install outfits,
- as they will soon be compelled to do, then the cost will be still lower.
- But even at the present time, if twenty-five men would unite in giving
- an order for twenty-five outfits of similar style, I am assured by two
- dealers that they would gladly fill such an order at a considerable dis-
- count from present prices. In large dental societies then, this proposi-
- tion should be placed before their members, who should be urged to
- join a "club" to buy and install X-ray equipments.

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BUT THESE ARE ALL only temporary expedients. The real solution of

- the problem must arrive by another route, and we may as well discuss
- \* it and face the facts now as later. The truth is that the dentists have
- but themselves to blame for their present dilemma. It is all a matter
- of the education of the public, and unfortunately in the past, dentists
- have led patients to believe that the so-called "treatment" of teeth is a
- small matter, something to be "thrown in" with the filling operation
- with little or no added cost.

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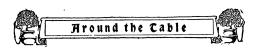
THE TRUTH is that the treatment and filling of root canals rank with the

- \* most difficult operations in general surgery, and far exceed all other den-
- tal work in importance and skill required. Unfortunately the dentists
- themselves have only just learned of the dire results which the patient
- \* may suffer from improper root canal treatment. But what is he to do?
- \* He has already taught the patient that the treatment is a small matter;
- \* worth little! What is he to do? What does he do? Sit in a corner
- ❖ and cry over the milk that he has spilled? But tears will not color his
- coffee. He must now as quickly as possible admit his error and cor-
- · rectly inform his patient both as to the importance and the value of his
- service.

#### H H

LET ANY DENTIST, even the so-called Average Man, with the low fee

- practice, frankly explain facts to his patient somewhat as follows:
- "Within the past few years we have discovered that many serious dis-
- eases, rheumatism, ulcerations of the stomach and the like, are due to pus
- poisoning from abscesses at the ends of teeth; and these abscesses are
- \* mainly due to the fact that the roots had been improperly filled. Since
- we have had the X-ray we have discovered that three quarters of all the
- roots filled in this country were improperly filled, because there was no
- Tools med in this country were improperly into because there was no
- \* way to know just how long a root canal really is. But now, with the
- use of an X-ray picture, we can get this knowledge, and consequently
   the best men are doing root canal work in this manner. That is why
- I must insist upon having one or two, or even more pictures if I am to
- I must misse upon having one of two, of even more pretares in I am to
- ❖ do your work properly. Indeed, I am not willing to do it in any other
- \* way, because my conscience will not permit me to be responsible for
- \* the possible infection of your system which may come later on, if I do
- my root work improperly. It will be well worth the extra expense to
- you to be sure that the roots are properly treated, and I will prove it
- to you by giving you a picture of the work when I have finished. If



- you cannot afford the full fee now, I advise you to have the root work
- . done properly now, and to have a temporary filling in the cavity until
- \* you can afford to have the cavity filled. The cavity is of the least con-
- \* sequence anyway. It is the root canal work that is important because
- upon that will depend your general health."

h H

NOW, MR. AVERAGE DENTIST, don't say "it can't be done." Just try

- \* it. If a thousand Average Dentists begin educating their patients along
- \* these lines, within a year a full third of them would have X-ray equip-
- \* ments in their offices, and they would at once cease to be Average Den-
- \* tists. They would have risen above the average.

H H

IT IS ONLY because of their ignorance that patients are unwilling to pay:

- fees that will permit the dentist to do good root canal work, and as it
- . has been the dentist who has kept them in ignorance it is but a right-
- . eous sort of justice that the dentist should find himself in this dilemma.
- . But there is no reason why the situation should continue. It is but a
- \* matter of education.

H H

WHEN BRIDGEWORK first came into vogue, the advertising dentist did

- sound service towards his fellow practitioners, when he advertised loudly
- \* that he could furnish "artificial teeth without plates." Quite often his
- product was no better, if as good, as the teeth supplied by his neighbor
- on a plate, but he collected more for his service. Why? Because he
- \* made his patient believe that what he supplied was worth more. There-
- fore the patient paid more.

a H

IN LIKE MANNER patients have been made to pay more for a shell gold

- \* crown than the same dentist could have collected for a gold filling in
- the same tooth, when if the truth were known the gold filling would
- have served the patient better.

H H H

IF THEN THE CHARLATAN and the quack can collect more for a less

- \* valuable service, simply by informing his patient that the service ren-
- dered is valuable, why may not the ethical man similarly collect a better
- fee for a better service? There is no doubt that he can, if he but go
- . about the matter in an honest and intelligent manner.

H H

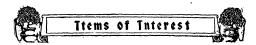
IN A NUTSHELL it comes to this. The dentist no longer does honest ser-

- vice if he fill a root canal without informing his patient that without the
- \* aid of the X-ray such work cannot certainly be done properly, and if
- . improperly done that his general health may suffer. Then the patient,
- \* fully informed of the facts, may decide whether to pay the added fee
- or not.

H H

BUT IT IS NOT fair for the Average Dentist to cry out: "I can't use the X-ray. My patients won't pay for it," until at least he has told the pa-

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- tient the truth, that without the X-ray he, the Average Dentist (nor
- any other dentist), cannot fill root canals without possible danger to
- the patient's health and even life. I would like some conscientious Aver-
- age Dentist, who thinks otherwise, to explain matters to ten of his
- poorer patients, and then report to me exactly what replies these pa-
- tients make.

THERE IS ANOTHER factor which will influence the solution of this prob-

- lem, and that factor is the Family Doctor. When the Family Doctor
- comes to fully appreciate the great truth promulgated by Hunter, and
- much resented in this country at that time, that a majority of all bridge-
- work is a menace to the health of the patient, the beginning of the end
- will have arrived. When every physician who finds a bridge in a pa-
- tient's mouth, insists upon having radiographs of all the roots used as
- piers; and when the radiographs show improper root filling, advises the
- ٠ patient to demand his fee back from the man who made the bridge;
- and when a few malpractice suits have been settled against dentists and
- bridgeworkers for improperly filling root canals, without informing pa-
- tients of the facts; and when all patients take the course of the woman
- \* who informed Friend George that she would intrust her work to his
- care, but that she would wish to see an X-ray picture of the root after
- filling, then will this problem have been solved.

BECAUSE JUST so soon as patients begin to ask for radiographic proof

- that their root canals have been properly filled, then will they be willing
- to pay for the radiographs, and all dentists will have X-ray outfits, be-
- cause compelled to do so.





April 7, 1915.

To the Editor of Items of Interest.

Dear Doctor:

In the March number of the ITEMS OF INTEREST, "B. E. L.," reviewing the second German translation of the seventh edition of Dr. Angle's well-known "Malocclusion of the Teeth," says: "The first German edition appeared in 1908, a year after its publication in America, and this early demand for a second edition is the best evidence of the interest our German colleagues take in this phase of dental practice. The seventh American edition is not yet exhausted, and thus proves again the soundness of the charge so frequently made by publishers, viz., American dentists are poor book buyers."

As your reviewer appears to be somewhat misinformed relative to the demand of the American edition, it seems unjust to accuse the American dentists of being "poor book buyers." Though the first German edition was exhausted well within a year after its publication, and the second edition being now nearly sold out, it, nevertheless, is of interest to know that the seventh American edition, far more extensive than the German, was quickly disposed of after its appearance, necessitating two subsequent reprints, both of which are now exhausted. Furthermore, with the demand for this work constantly increasing, the author is hard at work preparing the eighth edition, revised and enlarged, which is almost ready for the press.

This tends to prove an old saying of "Bob" Burdette that "people are pretty much like people," whether they be German dentists or American dentists. Given a book of merit it will be in demand here as it is abroad, provided its author is not content to "stand on the shoulders of others" for his materials and thoughts.

Cordially yours,

MILO HELLMAN



## National Society Meetings.

Panama-Pacific Dental Congress, San Francisco, Cal., August 30 to September 9, 1915.

Secretary, Dr. Arthur M. Flood, 240 Stockton St., San Francisco, Cal.

## State Society Meetings.

- ARIZONA STATE DENTAL SOCIETY, Phoenix, Ariz., November, 1915. Secretary, Dr. J. L. O'Connell, Phoenix, Arizona.
- COLORADO STATE DENTAL ASSOCIATION, June 17, 18, 19, 1915. Secretary, Dr. Earl W. Spencer, 119-120 Pope Block, Pueblo, Colo.
- FLORIDA STATE DENTAL SOCIETY, Pass-a-Grille, Fla., June 9-11, 1915. Secretary, Dr. Alice P. Butler, Gainesville, Fla.
- GEORGIA STATE DENTAL ASSOCIATION, Atlanta, Ga., June 17-19, 1915. Secretary, Dr. M. M. Forbes, 803 Candler Bldg., Atlanta, Ga.
- Kentucky State Dental Association, Ashland, Ky., June 8-10, 1915. Secretary, Dr. Chas. R. Shacklette, The Atherton Bldg., Louisville, Ky.



LOUISIANA STATE DENTAL SOCIETY, Grunewald Hotel, New Orleans, La., June 3-5, 1915.

Secretary, Dr. P. Trowbride, Franklin, La.

- MAINE DENTAL SOCIETY, Portland, Me., June 28-30, 1915. Secretary, Dr. I. E. Pendleton, Lewiston, Me.
- MARYLAND STATE DENTAL ASSOCIATION, Baltimore, Md., June 10-11, 1915.
  - Secretary, Dr. F. F. Drew, 701 N. Howard St., Baltimore, Md.
- MINNESOTA STATE DENTAL ASSOCIATION, Minneapolis, Minn., June 11-12, 1915.
  - Secretary, Dr. Max E. Ernst, 614 Lowry Bldg., St. Paul, Minn.
- MISSOURI STATE DENTAL ASSOCIATION, Golden Jubilee Meeting, Jefferson City, June 10-12, 1915.
  - Secretary, Dr. S. C. A. Rubey, New York Life Bldg., Kansas City, Mo.
- MONTANA STATE DENTAL SOCIETY, Helena, Mont., July 15-17, 1915. Secretary, Dr. F. W. Adams, Chicago Block, Billings, Montana.
- New Hampshire State Dental Society, Weirs, N. H., June 22-24, 1915.
  - Secretary, Dr. Louis I. Moulton, 15 No. Main St., Concord, N. H.
- New Jersey State Dental Society, Asbury Park, July 21-24, 1915. Secretary, Dr. John C. Forsyth, 430 E. State St., Trenton, N. J.
- New Mexico State Dental Society, Albuquerque, N. M., date will be announced later.
  - Secretary, Dr. J. J. Clarke, Artesia, N. M.
- NORTH CAROLINA DENTAL SOCIETY, Wrightsville Beach, N. C., June 23-25, 1915.
  - Secretary, Dr. R. M. Squires, Wake Forest, N. C.
- Ohio State Dental Society, Columbus, Ohio, December 7-9, 1915. Secretary, Dr. F. R. Chapman, 305 Schultz Bldg., Columbus, Ohio.
- Pennsylvania State Dental Society, Reading, Pa., June 22-24, 1915. Secretary, Dr. L. M. Weaver, Philadelphia, Pa.
- SOUTH DAKOTA STATE DENTAL SOCIETY, Rapid City, S. D., July 22-24, 1915.
  - Secretary, Dr. T. E. Johnson, Rapid City, S. D.
- TENNESSEE STATE DENTAL ASSOCIATION, Sewanee, Tenn., June 24-26, 1915.
  - Secretary, Dr. C. Osborn Rhea, 6251/2 Church St., Nashville, Tenn.

UTAH STATE DENTAL SOCIETY will meet in San Francisco, Cal., during the Panama-Pacific Dental Congress in August, 1915.

Secretary, Dr. E. C. Fairweather, Boston Bldg., Salt Lake City, Utah. VIRGINIA STATE DENTAL ASSOCIATION, Richmond, Va., Nov. 4-6, 1915. Secretary, Dr. C. B. Gifford, Norfolk, Va.

WISCONSIN STATE DENTAL SOCIETY, Oconomowoc, Wis., July 13-15, 1915. Secretary, Dr. O. G. Krause, 1209 Wells Bldg., Milwaukee, Wis.

### Report of Dr. Jos. D. Eby.

## Member Cransportation Committee, International Dental Congress; Member Cransportation Committee, National Dental Association.

ATTENTION SOUTHERN DENTISTS:

The time is now approaching when all members of the National Dental Association should begin to consider seriously their prospective plans of attending the joint session of the National Dental Association and the International Dental Congress to be held in San Francisco, at the Panama-Pacific Exposition, August 30th to September 9th.

This is the opportunity of a life-time to combine business and pleas-

ure in a Western trip.

The wide range for the selection of literary and clinical material, also exhibits, has placed the International Dental Congress meetings of the past among the greatest in dental history. The Organization Committee of this Congress have been at work more than two years, and it is safe to predict that this Congress will eclipse all other similar meetings of the past.

The question of itinerary is governed almost entirely by the time one wishes to spend. Stopovers and varied routings can be arranged with practically no additional transportation expense, excepting over the Northern lines.

As a member of the Transportation Committee of the National Dental Association, also same committee, Panama-Pacific Dental Congress from the territory including North Carolina, South Carolina, Tennessee, Georgia, Florida, Alabama and Mississippi, much time has been spent in considering the numerous routes, etc., with a view toward being able to make the best recommendations to members from this territory.

I beg to advise, after careful consideration, I have decided the most practical, attractive, and best way for the dentists in the Southeast who expect to attend this meeting will be to make New Orleans a concentrating point, and have therefore arranged with the Southern Pacific Railroad to operate special private Pullman sleeping cars from New Orleans through to Los Angeles on the following schedule:

Lv. New Orleans	11:30 P.M.,	Aug.	19th,	SP.	Train	No.	9
Ar Houston	11:30 A.M.,	"	20th,	"	,,	,,	"
Lv. "	11:50 A.M	,,	20th,	"	"	,,	,
Ar. San Antonio	7:20 P.M.,	,,	20th.	,,	,,	,,	,,
Lv. " "	8:50 P.M.				"		
Ar. El Paso	6:30 P.M.,		21st,	"	"	"	,,



Lv. El Paso	6:00 P.M.,	Aug.	22nd,	SP.	Train	No.	9
Ar. Los Angeles	9:20 P.M.,	"	-23rd,	,,	,,	"	,,
Lv. " "	7:25 A.M.,	,,	28th,	"	"	"	21
Ar. San Francisco	10:55 P.M.,	"	28th,	,,	"	"	,,

I hour, 5 minutes stopover at San Antonio.

25 hours, 50 minutes stopover at El Paso.

4 days' stop over at Los Angeles.

You will note this schedule shows our arrival in El Paso 6:30 P. M., 21st, leaving 6:00 P. M., 22nd, or stopover at that point of approximately 24 hours. Delegates can spend night on car, using berths, instead of hotels. This was arranged on account of invitation extended by the El Paso Chamber of Commerce offering us an excellent free trip in and around the City of El Paso, together with side trip over the border line to the City of Juarez, Mexico, which I am sure will prove very enjoyable. Also please note that stopover is made at Los Angeles of four days, which is arranged for sight seeing in and around that city, together with plenty of time to make side trip to San Diego to see the Exposition at that point, without additional transportation expense.

On arrival in Los Angeles, the private Pullman cars will be dispensed with, and from there to San Francisco, Pullman parlor observation cars will be used, and the schedule, as shown, is via the Coast Line Division of the Southern Pacific Railroad, which takes in all of the world's famous resorts of California, such as Santa Barbara, San Luis Obispo, Paso Robles Hot Springs, Del Monte, Monterey, Santa Cruz, Pacific Grove of Big Trees, San José, etc., arriving in San Francisco

night of the 28th, thirty-six hours before our meeting convenes.

I will also state that the trains on which these special cars move will carry dining and observation cars, etc.; in fact, all features that go to make up the best there is to be had in train service.

Stopovers at any and all points desired will be allowed by the railroads, going and returning, within final limit of tickets, which will be three months from date of sale.

The New Orleans gateway is by far the most logical and convenient for a concentrating point of any in the Southeast, and I trust you will give this matter serious consideration, and arrange to join this party, so that we can all travel in one body.

On going trip, be sure and have your ticket routed via New Orleans and Southern Pacific Railroad to San Francisco. Returning, would suggest following lines, which can be secured for the same rate, namely, Southern Pacific to Ogden, D. & R. G. to Denver, up to Kansas City, Wabash to St. Louis, L. & N. to Nashville, thence any direct line to starting point.

The Southern Pacific line from San Francisco takes in the beautiful part of California known as the Lake Tahoe Region. Side trip can be made from Truckee, a main line point, through the Lake Regions, including boat trip of 75 miles around the Lakes, for \$5.00. Thence to Ogden, from which point side trip can be made through the Yellowstone National Park, consisting of round trip railroad fare, four nights' lodging,

and thirteen meals while in the Park, at rate of \$53.50. Thence, return back to Salt Lake, where, after seeing the sights of this wonderful city, the D. & R. G. can be used to Colorado Springs, and at this point "Manitou," the "Garden of the Gods" and Pikes Peak are to be seen. Thence to Denver, at which point sight-seeing in and around the city, visiting the World's Famous Indian Congresses, etc. From Denver, would suggest Union Pacific Lines to Kansas City, Wabash R. R. to St. Louis, L. & N. to Nashville, thence any direct line from that point to original starting point.

The following are the rates applying from some of the most prominent points in the States of the Southeast for the trip as outlined above: also rate covering trip for those who may desire to take in Portland, Seattle, and the North Pacific Coast. Correspondingly low rates are offered by the railroads from all other points in this territory than those as enumerated:

Rates		
From	Via Direct Routes	Via North Pacific Coast
Atlanta, Ga	\$71.90	\$95.00
Macon, Ga	72.00	96.85
Augusta, Ga	78.25	101.60
Savannah, Ga	80.50	104.50
Chattanooga, Tenn	66.95	88.40
Knoxville, Tenn	$72.55$	91.00
Nashville, Tenn	63.50	85.25
Memphis, Tenn	· · · · 57·5°	81.20
Asheville, N. C	· · · · 79.05	9 <b>7</b> .50
Charlotte, N. C	84.15	102.32
Raleigh, N. C	87.95	106.12
Winston-Salem, N. C.	84.15	102.32
Spartanburg, S. C	81.50	101.00
Charleston, S. C		106.85
Columbia, S. C	82.45	104.24
Greenville, S. C	80.00	101.00
Birmingham, Ala	63.50	88.40
Montgomery, Ala		88.40
Mobile, Ala		88.40
Jacksonville, Fla		104.50
Tampa, Fla		113.00
Palatka, Fla	82.70	106.70
Columbus, Miss		84.55
Greenwood Miss		83.75
Meridian, Miss		83.75
Hattiesburg, Miss	57.50	83.75

Approximate charge for lower berth in Pullman sleeping car to make direct round trip, as outlined above, including stopovers at prominent points from New Orleans, would be \$32.00. The North Pacific Coast Tour, via Portland, etc., would be approximately \$42.00.

It will be my pleasure to see that you are furnished with any other



detailed information you may desire in regard to rates, tickets, limits, stopovers, side trips, etc., and you can either address letter to myself or to Mr. D. L. Griffin Agent, Southern Pacific Company, Atlanta, Ga., and such information as you desire will be furnished you promptly, together with literature pertaining to California, the Exposition, and Dental Congress. Either of us will making sleep car reservations for you on receipt of advice as to what is wanted in this respect.

Please let us hear from you, and oblige,

Yours truly,

Jos. E. Eby,

National Transportation Commissioner.

### Che Forsuth Dental Infirmary tor Children. Permanent Staff Appointments.

An examination of graduates in dentistry (of less than three years' standing), for appointments to positions on the Permanent Staff for full and one-half time service, will be held on Monday, June 14th, at the Infirmary.

Appointments will be made for one or two years as follows:

Full time service, requiring every day from 9 A. M. to 5 P. M., with one afternoon off a week, at a salary of \$1,000 per year. One-half time service, requiring twenty-four hours per week, salary \$300; and will be made subject to satisfying the requirements of the Massachusetts State Board of Registration in Dentistry.

Members of this staff will be entitled to the advantages of reports and clinics by experts in the various branches of dentistry from different parts of the world, in addition to the numerous regular clinics.

All material and necessary operating instruments will be furnished; up-to-date apparatus, including electric engines, sterile instrument trays, fountain cuspidors, compressed air and modern operating-room-type lavatories are available for use

A diploma of service will be issued to each member of this staff who has completed this term to the satisfaction of the Trustees.

Applications for the above positions should be made not later than June 10th to the Director, Harold DeW. Cross, D.M.D., 140 The Fenway, Boston, Mass., who will gladly furnish information to those interested.

#### Undergraduate Assistants.

During the months of June, July, August and September an opportunity is offered by the Trustees of the Forsyth Dental Infirmary for Children to a limited number of undergraduate students to act as assistants in the clinics of the Infirmary. This privilege permits a student to obtain unusual clinical advantages in the various departments of the institution where operative dentistry, orthodontia, nose and throat, oral

surgery, radiography, pathological diagnosis and research work are continually carried on.

Operators' gowns and all instruments are furnished. Over three hundred children are treated daily.

For further details apply before June 10th to the Director, Dr. Harold DeW. Cross, 140 The Fenway, Boston.

### Northeastern Dental Association.

The Northeastern Dental Association will hold their twenty-first annual meeting in Springfield, Mass., on October 13, 14, 15, 1915.

Dr. ALVIN A. HUNT, Secretary.

125 Trumbull St., Hartford, Conn.

### Che Florida State Dental Society.

The next annual meeting of the Florida State Dental Society will be held June 9, 10 and 11, 1915, at Pass-a-Grille, Fla. All ethical dentists are urged to attend.

ALICE P. BUTLER, Corresponding Secretary.

Gainesville, Fla.

### Utah State Dental Society.

The Utah State Dental Society desires to entertain all dentists who visit Salt Lake or Ogden, and the undersigned would be very glad to be notified of the time of arrival of dentists either individually or collectively, in order that arrangements may be made for fraternal greetings and entertaining.

EARL G. VAN LAW, Chairman Entertainment Committee. 913-15 Walker Bank Bldg., Salt Lake City, Utah.

### New Mexico Dental Society.

The New Mexico Dental Society will meet at Albuquerque, N. M., on Monday, August 23rd. All dentists who will be enroute to the National Dental, Panama-Pacific and the other meetings, are invited to stop with us a day, or longer.

Dr. J. J. CLARKE, Secretary.

Artesia, N. M.

## Wyoming Board of Dental Examiners.

The Wyoming Board of Dental Examiners will meet at Cheyenne, Wyo., in the Senate Chamber at the State Capitol, on the 29th and 30th of June and 1st day of July, 1915.



The written examination consists of Anatomy, Physiology, Histology and Bacteriology, Chemistry and Metallurgy, Oral Surgery, Anaesthetics, Operative and Prosthetic Dentistry, Materia Medica and Therapeutics, Prophylactics and Orthodontia.

Applicants must present a full plaster model of upper and lower jaws of teeth, also one without teeth. Practical work will be required from all candidates taking the examination. The candidate is required to furnish his own operating instruments, dental engine, amalgam, gold, wax and modeling compound.

An examination is required of all applicants and only holders of diplomas from reputable dental colleges are eligible to such examination. The board does not interchange with other States, nor issue any temporary permits.

For further information and application blanks, address
Peter Appel, Jr., Secretary.

P. O. Box 643, Cheyenne, Wyo.

## New Mexico Board of Dental Examiners.

The New Mexico Board of Dental Examiners will hold their next meeting at Sante Fe, commencing August 17, 1915.

Applicants must come prepared to do practical operations at the chair, must bring full denture models, for the articulation of and the carrying of full case to the point of vulcanizing, must have models for the making and articulation of a gold shell crown, and a bicuspid richmond crown. Anyone presenting without sufficient instruments and models will not be allowed to proceed with the practical work.

Further information and rules for examination will be furnished by the Secretary.

M. J. MORAN, Secretary.

Deming, New Mexico.

### Indiana State Board of Dental Examiners.

The next meeting of the Indiana State Board of Dental Examiners will be held at the State House, Indianapolis, commencing June 14th and continuing six days.

For application blanks and full particulars address

Dr. Fred J. Prow, Secretary.

Bloomington, Indiana.

## Dental Commissioners of Connecticut.

The Dental Commissioners of the State of Connecticut hereby give notice that they will meet at Hartford, on Thursday, Friday and Saturday, June 17, 18 and 19, 1915, to examine applicants for license to practice dentistry. Application blanks, revised requirements, etc., will be mailed by the recorder upon request.

By order of the Commission.

EDWARD EBERLE, Recorder.

902 Main St., Hartford, Conn.

## Idaho State Board of Dental Examiners.

The next meeting of the Idaho State Board of Dental Examiners will be held in Boise beginning Tuesday, July 6, 1915, at 9 A. M., at the State Capitol.

For application blanks and any information regarding the same address

ALBERT A. JESSUP, D.D.S., Secretary.

Box 1414, Boise, Idaho.

### Delta Sigma Delta Fraternity.

The thirty-first annual meeting of the Supreme Chapter of Delta Sigma Delta Fraternity will be held in the Auditorium Bldg., San Francisco, Cal., Wednesday, September 1, 1915, at 10 A. M.

The regular order of business will be carried out, to be followed by initiatory exercises in the afternoon. The annual banquet will be held at the St. Francis Hotel, at 7 o'clock P. M. The headquarters of the Fraternity will be at the Hotel Clift.

By order of the Supreme Chapter.

BURTON LEE THORPE, Supreme Grand Master.

R. Hamill D. Swing, Supreme Scribe.

## North Dakota Board of Dental Examiners.

The next regular meeting of the North Dakota State Board of Dental Examiners will be held in the Armory at Fargo, N. Dak., beginning July 13, 1915. All applications must be in the hands of the Secretary by July 3rd.

For further particulars write,

F. A. Bricker, Secretary.

Fargo, N. Dak.